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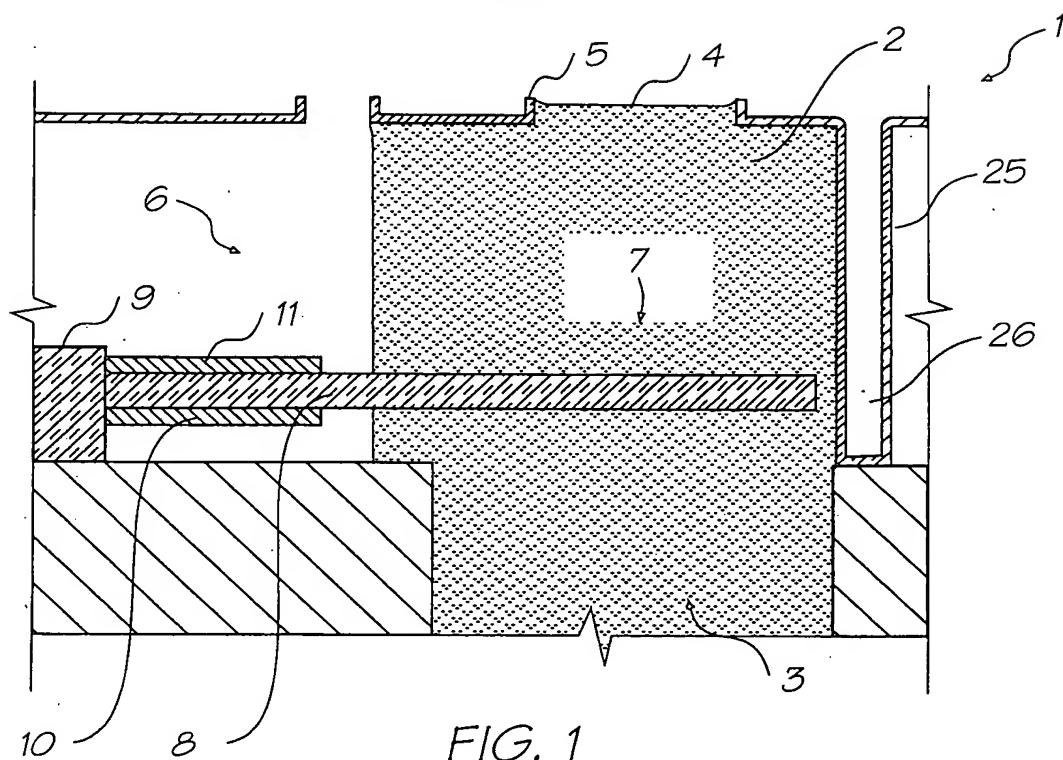


FIG. 1

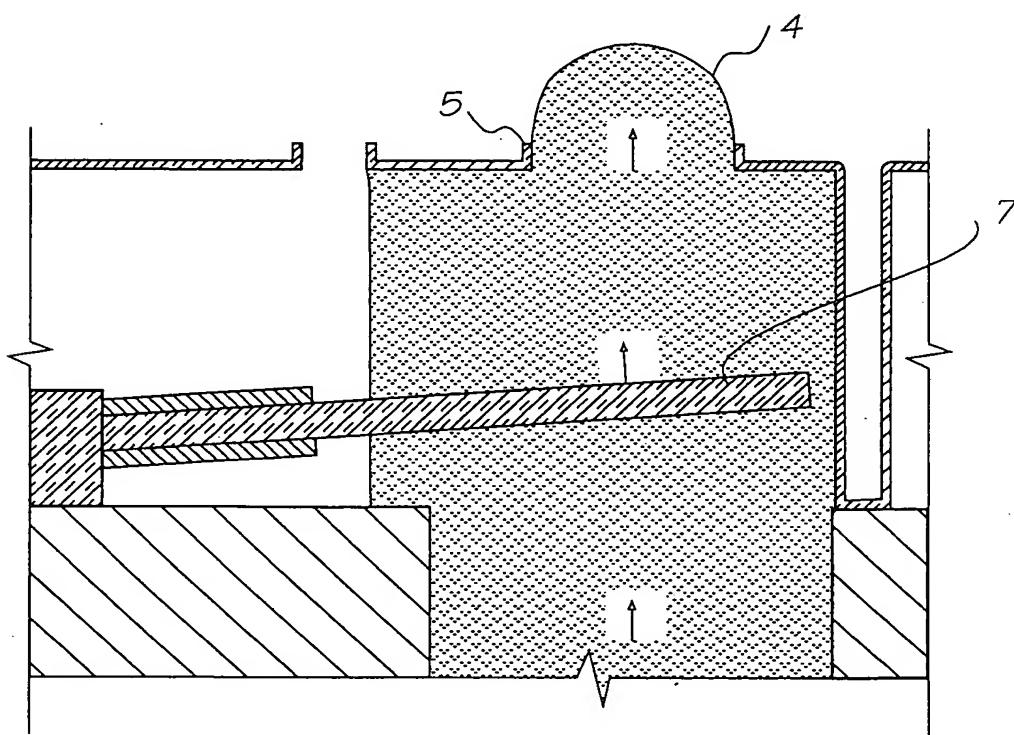


FIG. 2

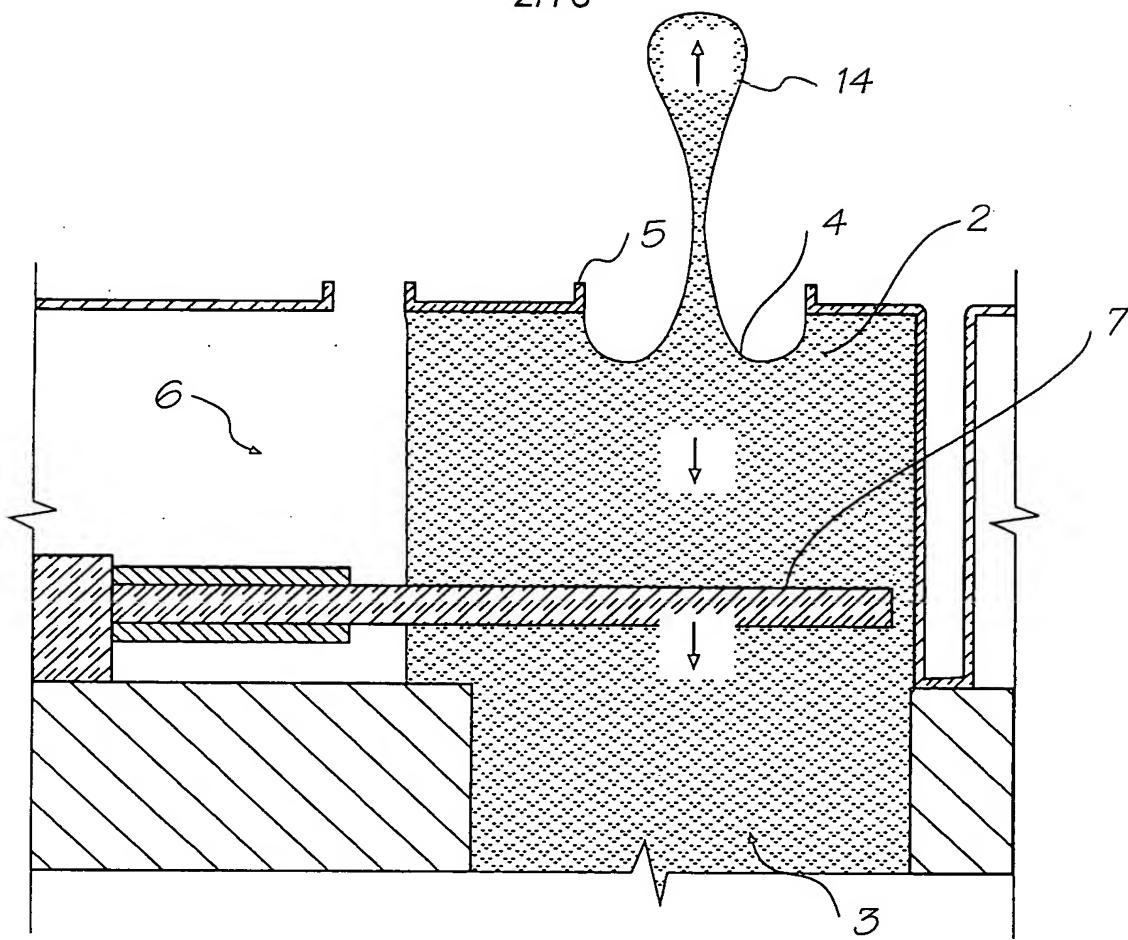


FIG. 3

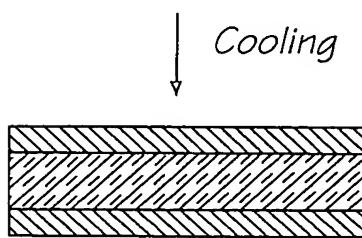
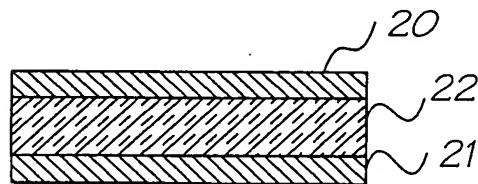


FIG. 4

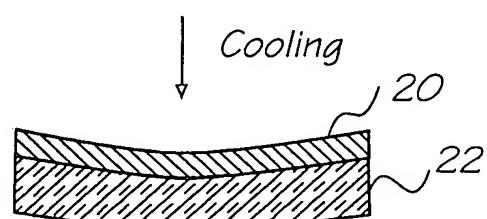
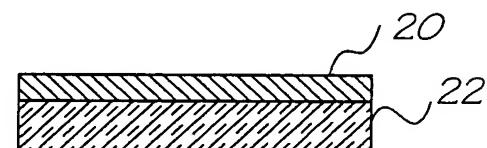


FIG. 5

30

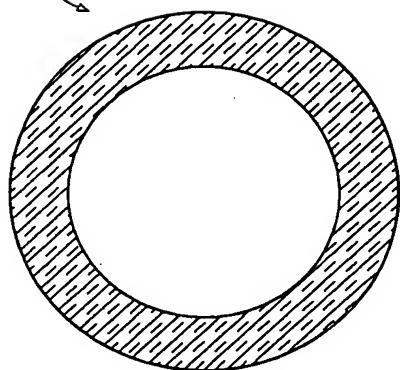


FIG. 6

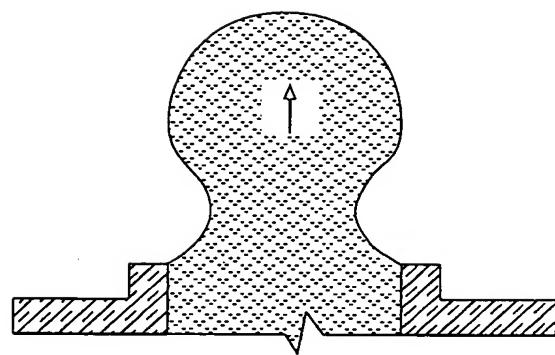


FIG. 7

35

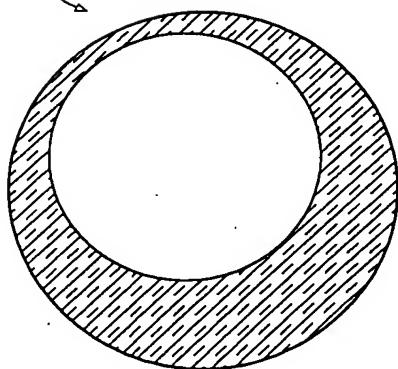


FIG. 8

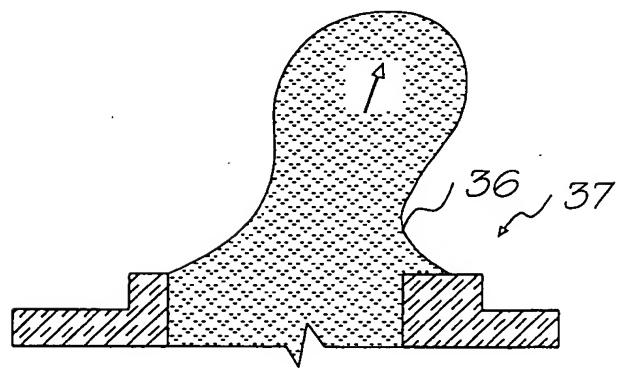


FIG. 9

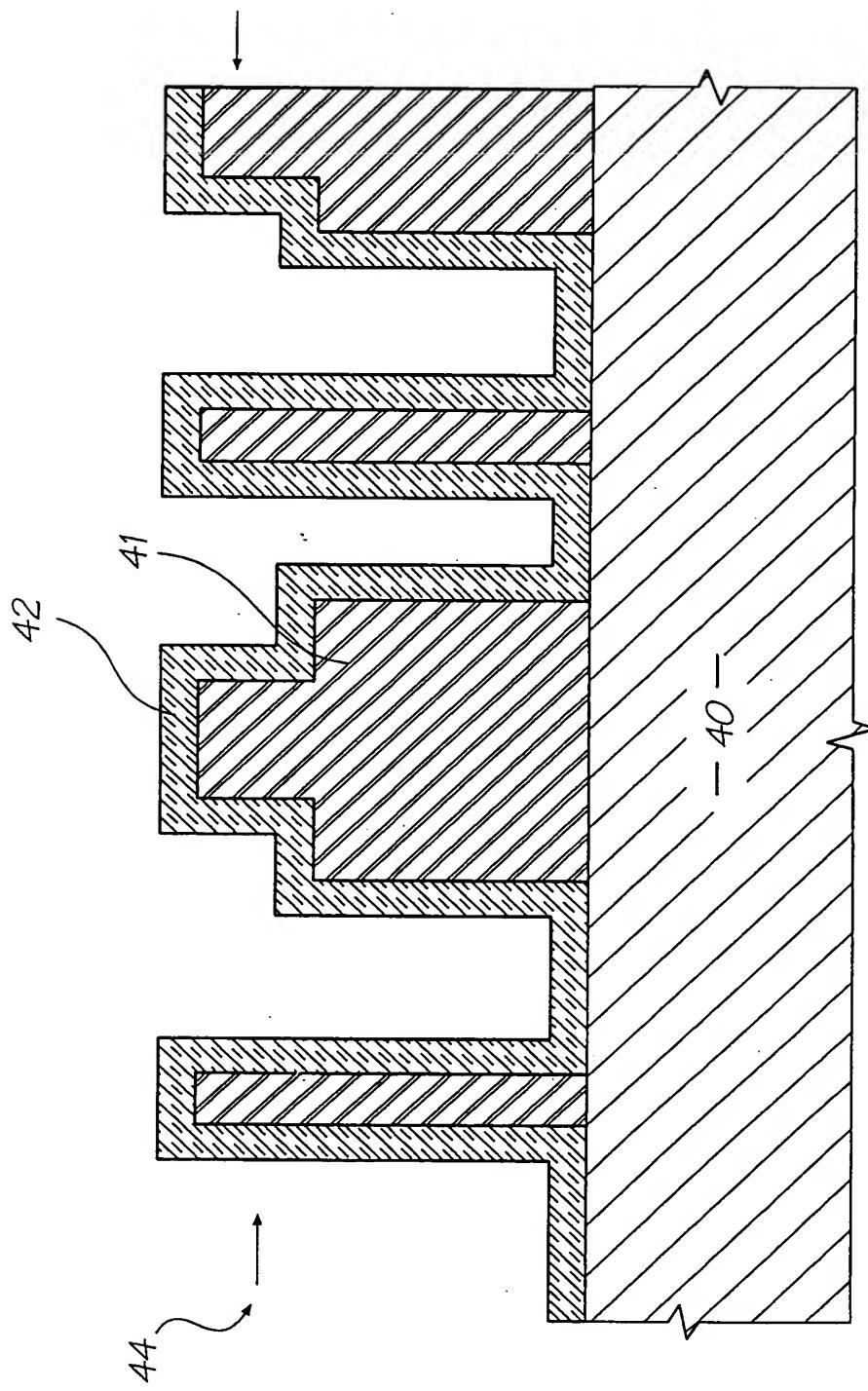


FIG. 10

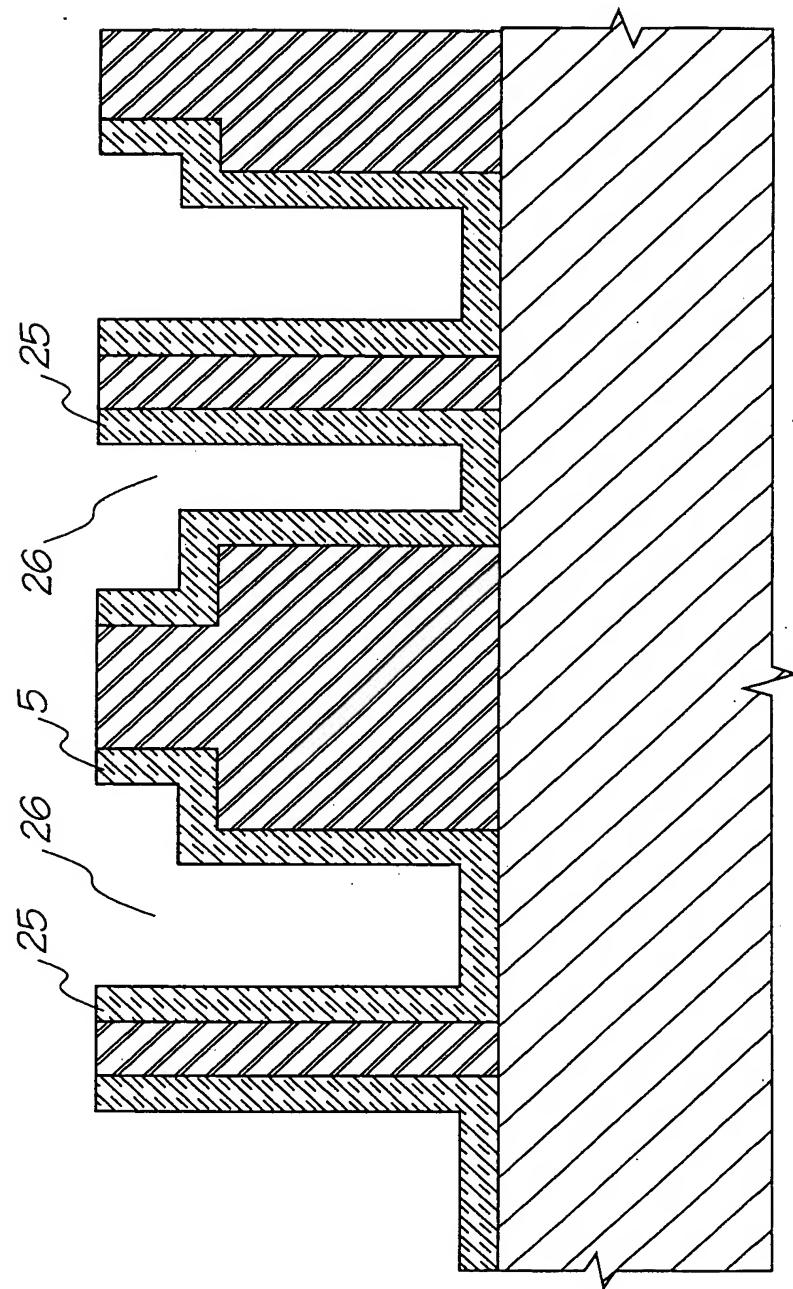


FIG. 11

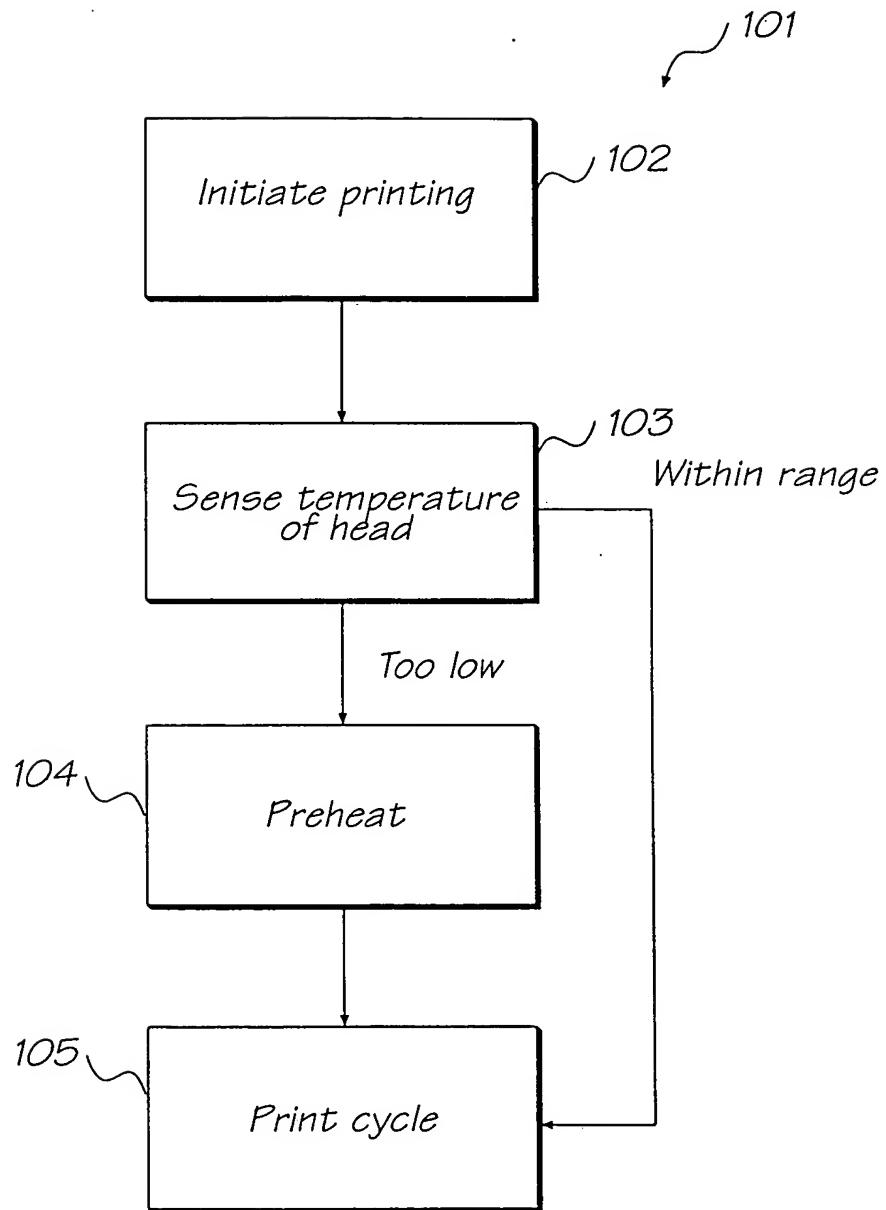


FIG. 12

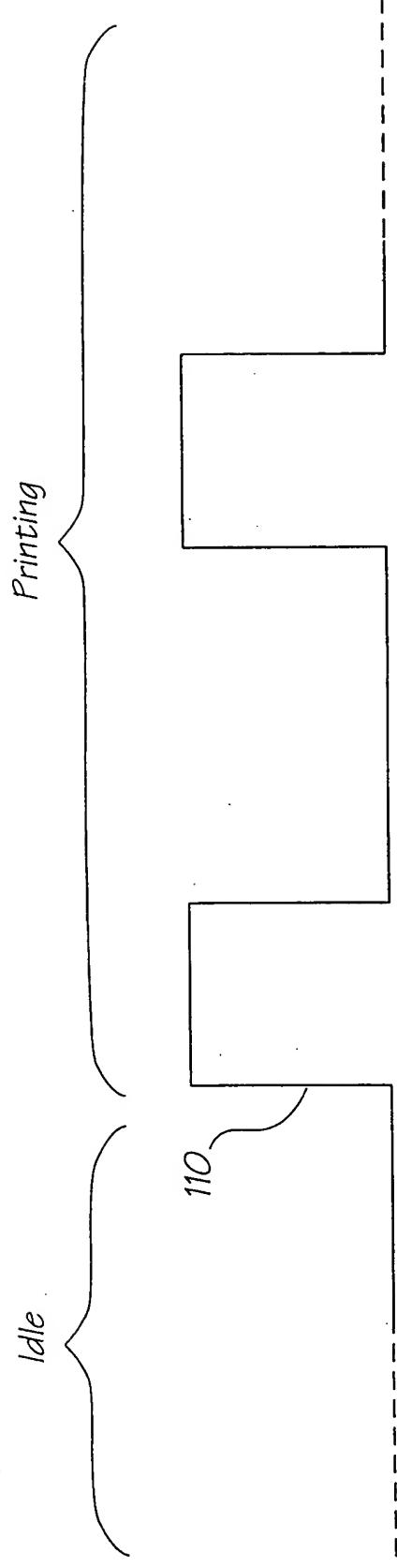


FIG. 13

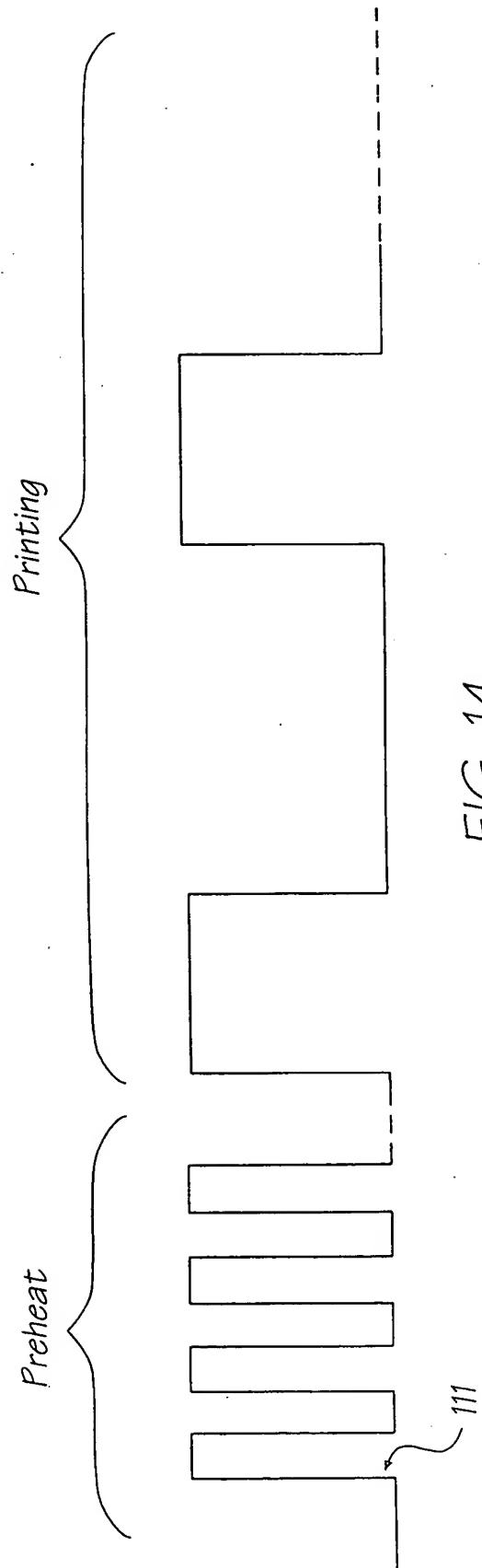


FIG. 14

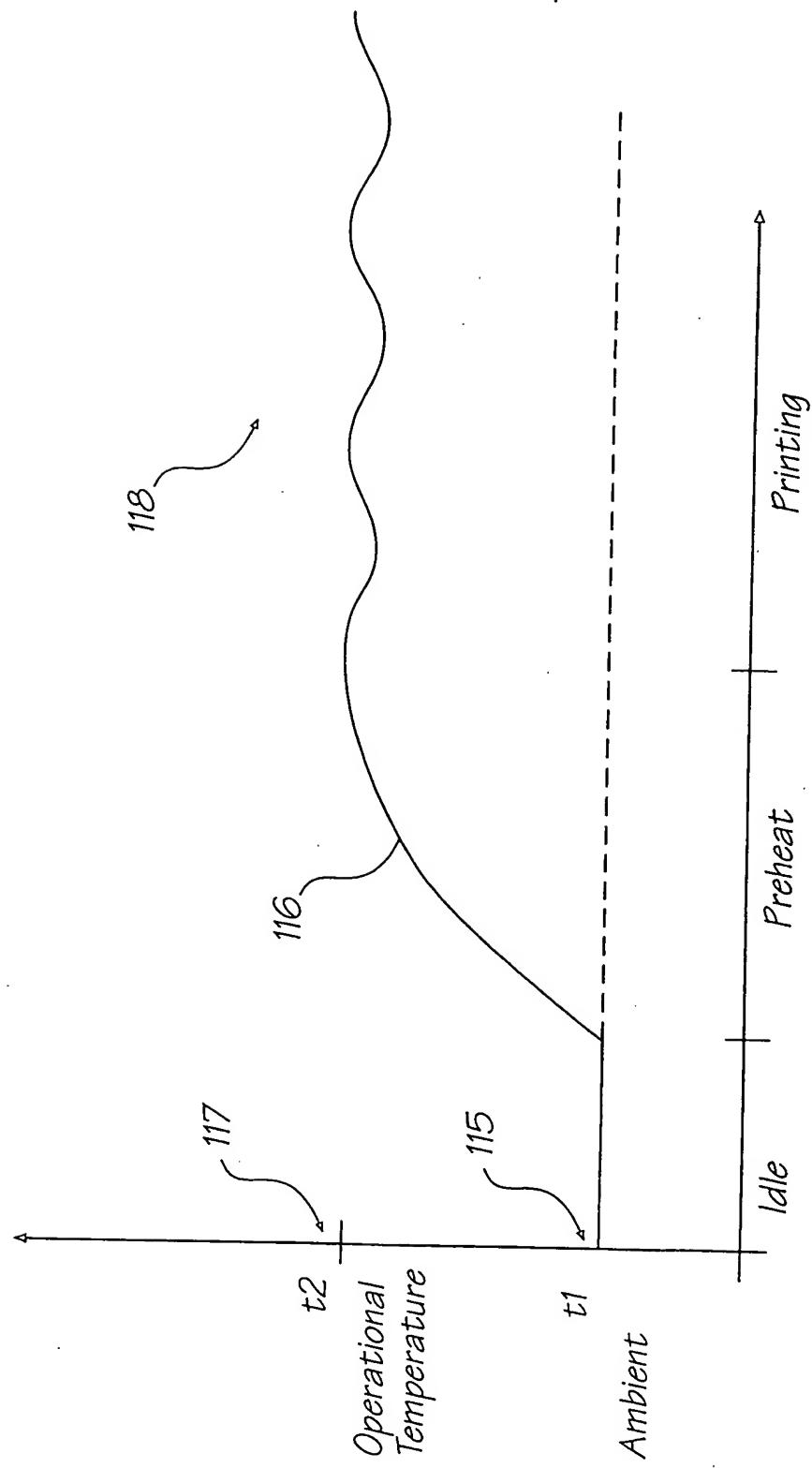


FIG. 15

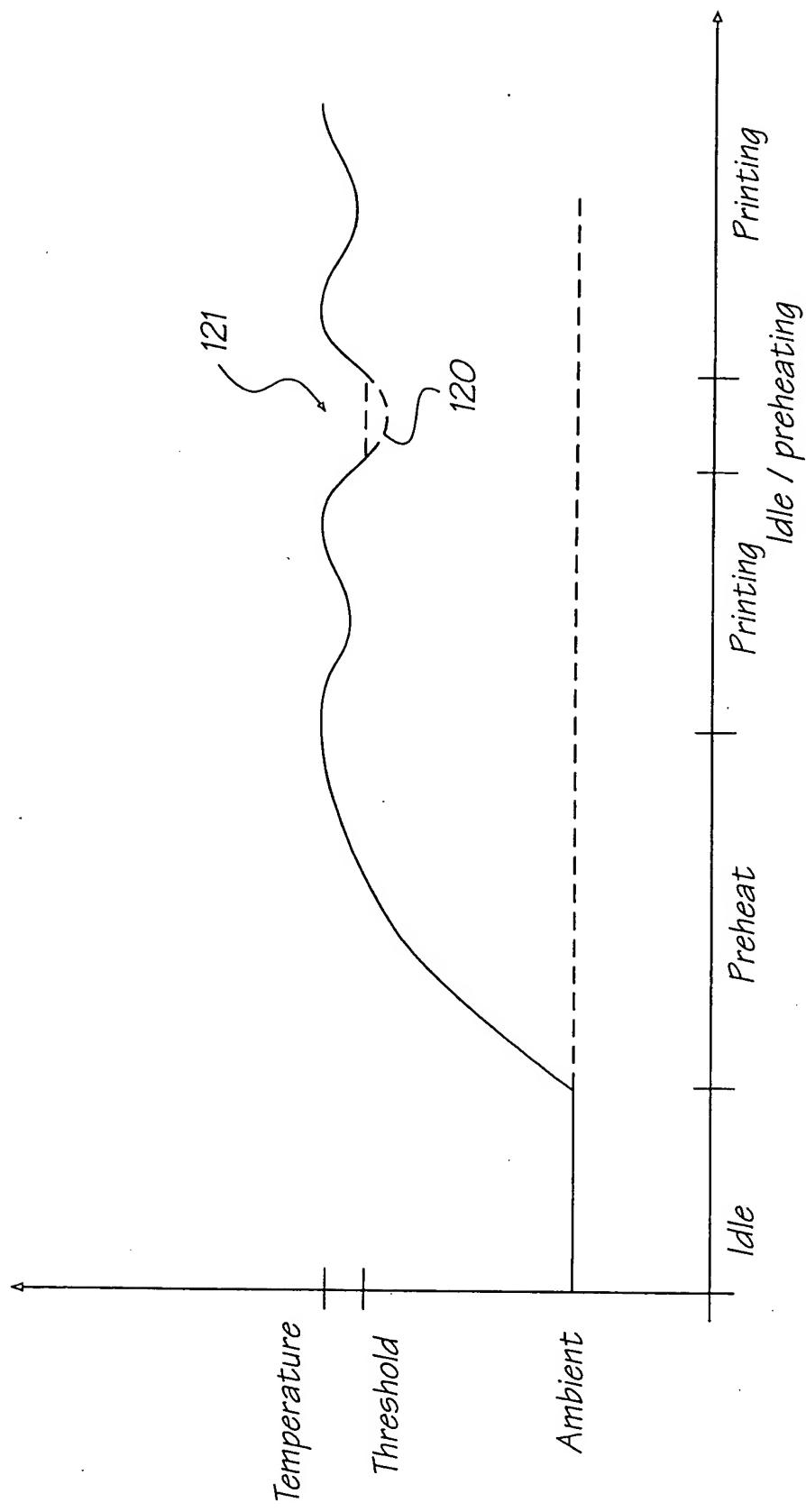


FIG. 16

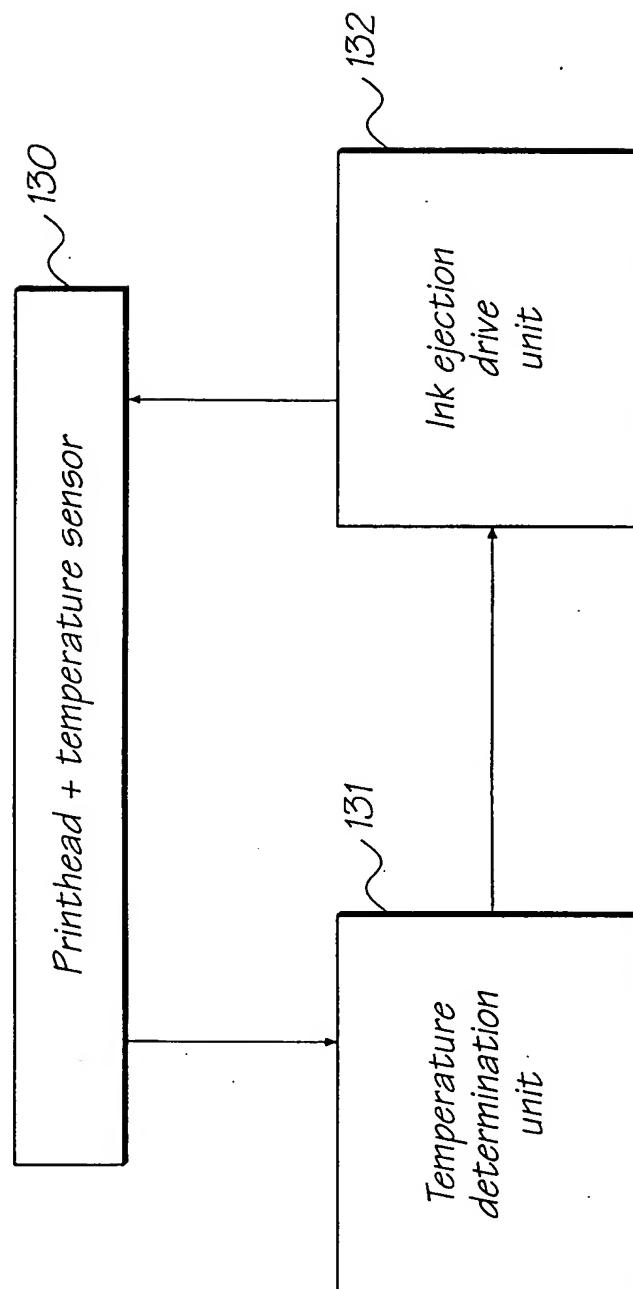


FIG. 17

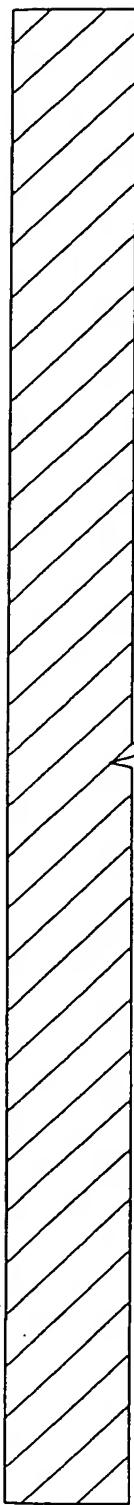


FIG. 18

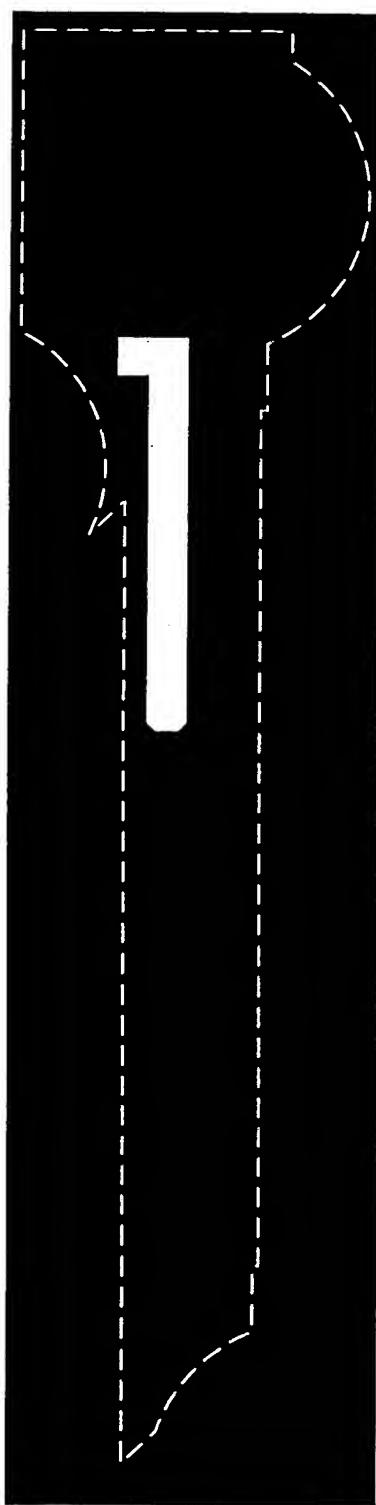
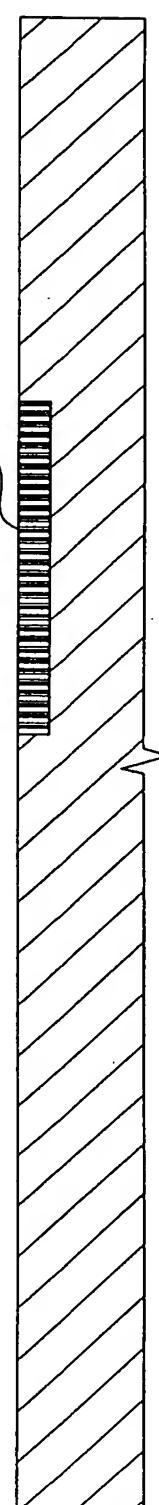


FIG. 19

N-Well mask



Implant N-Well

FIG. 20

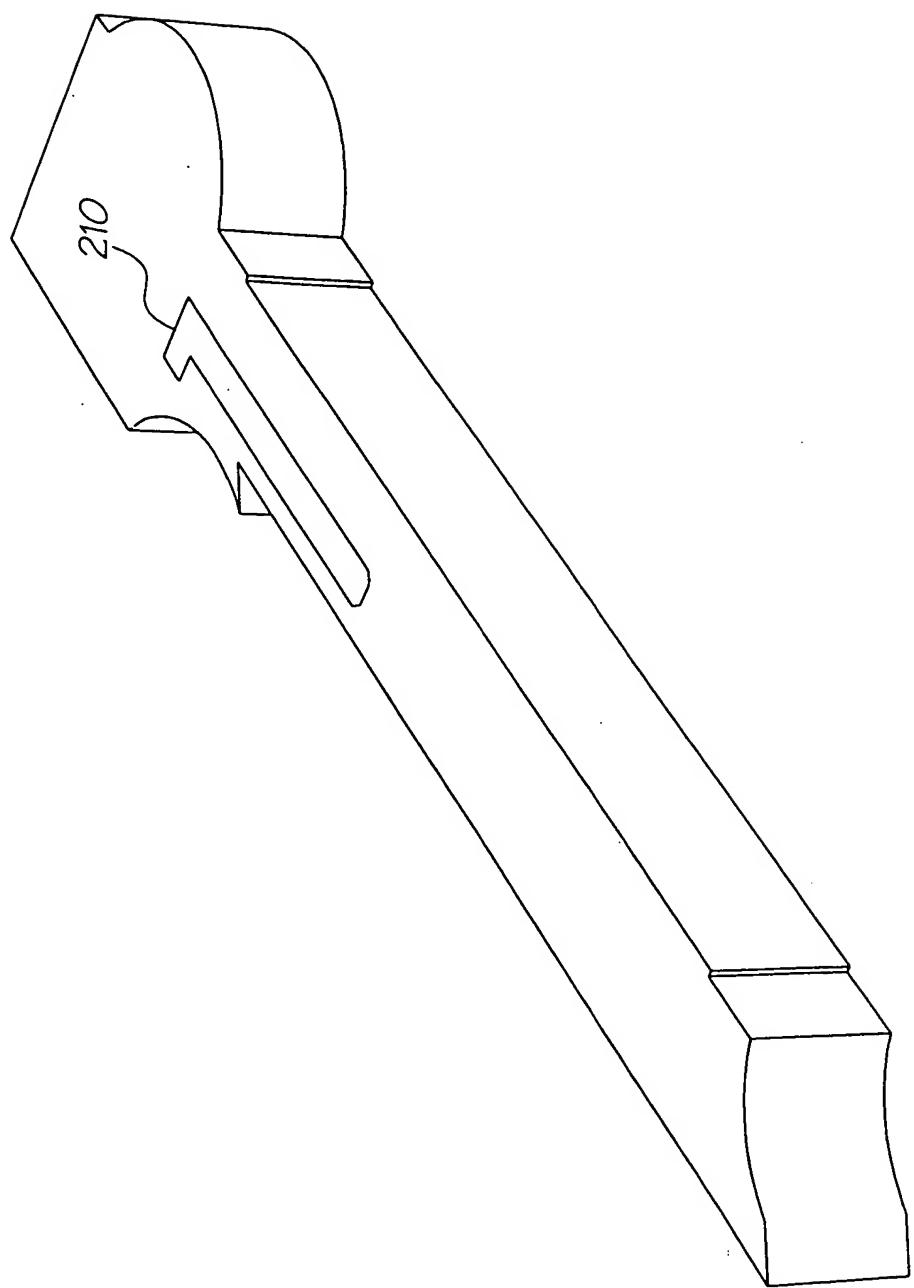
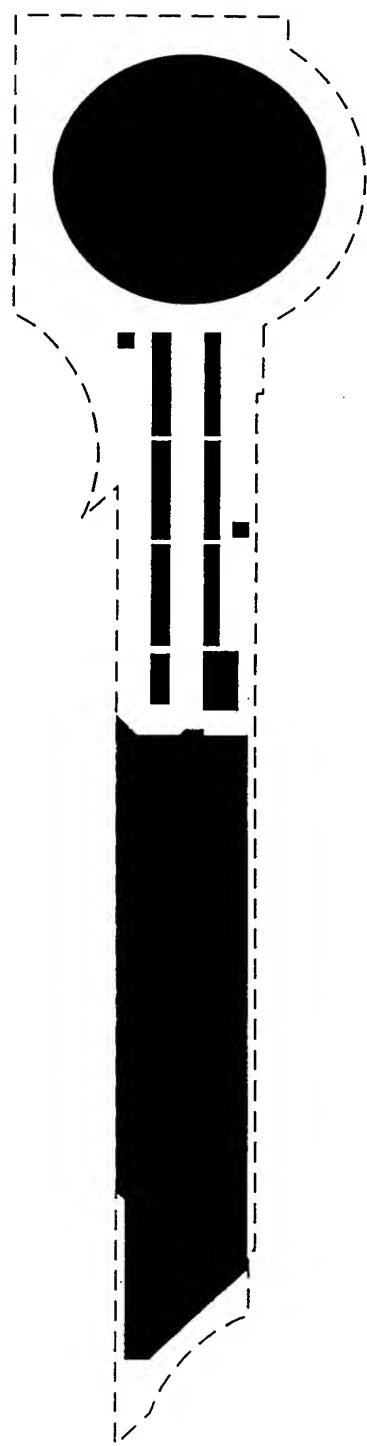
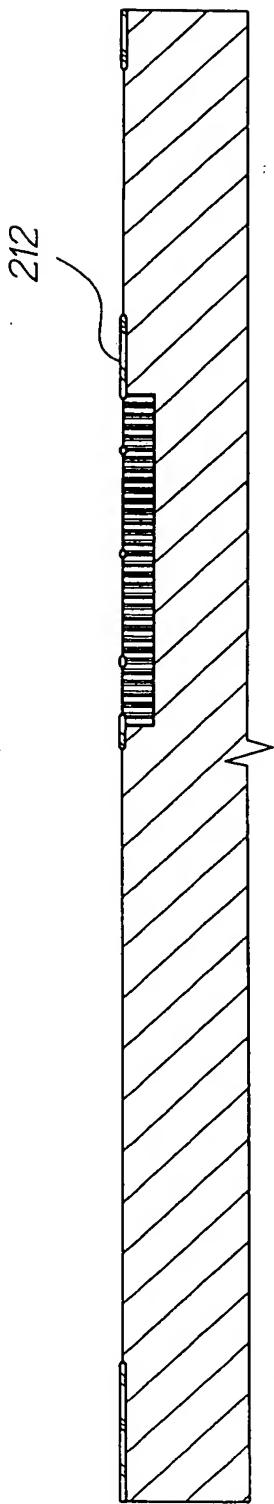


FIG. 21



Active mask

FIG. 22



Grow field oxide

FIG. 23

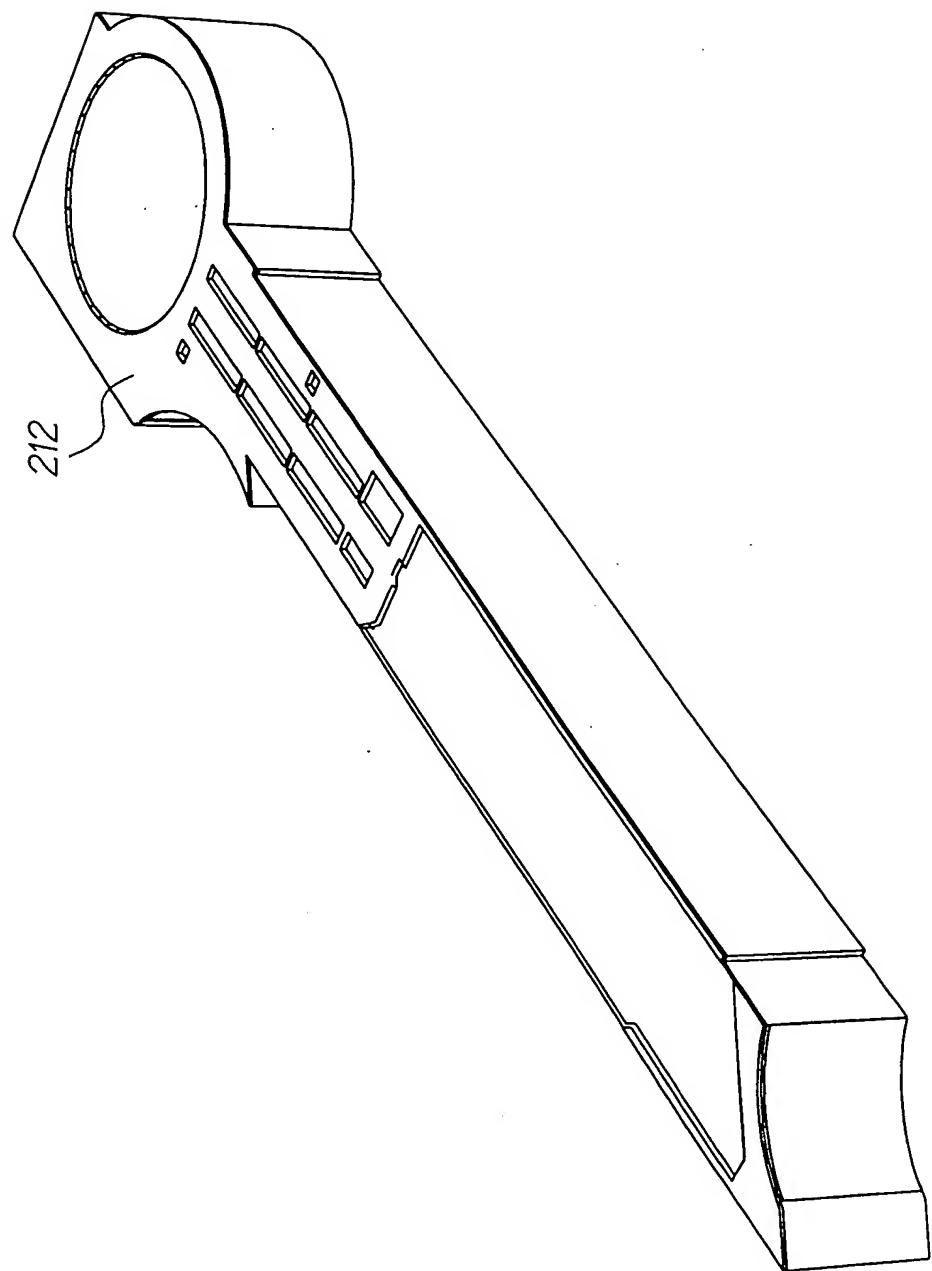
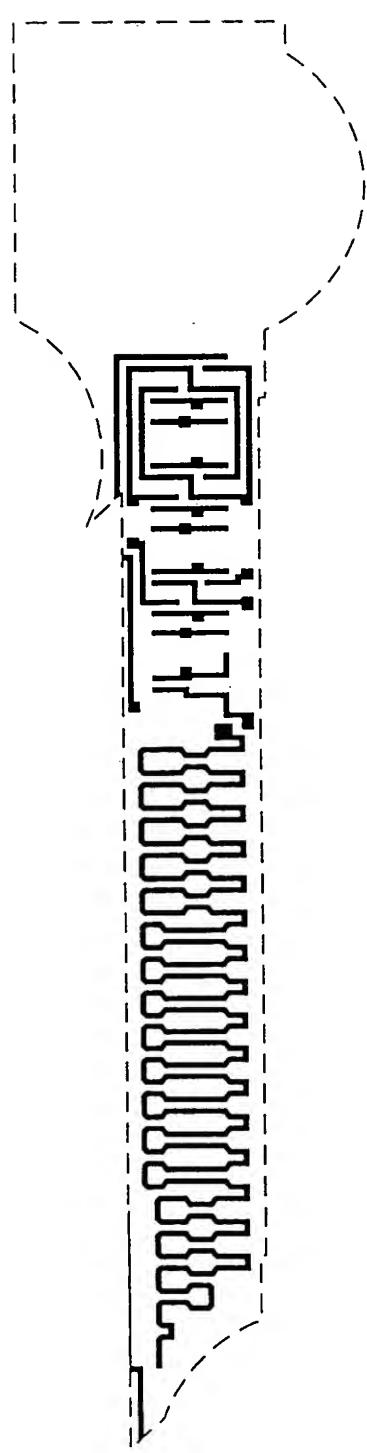
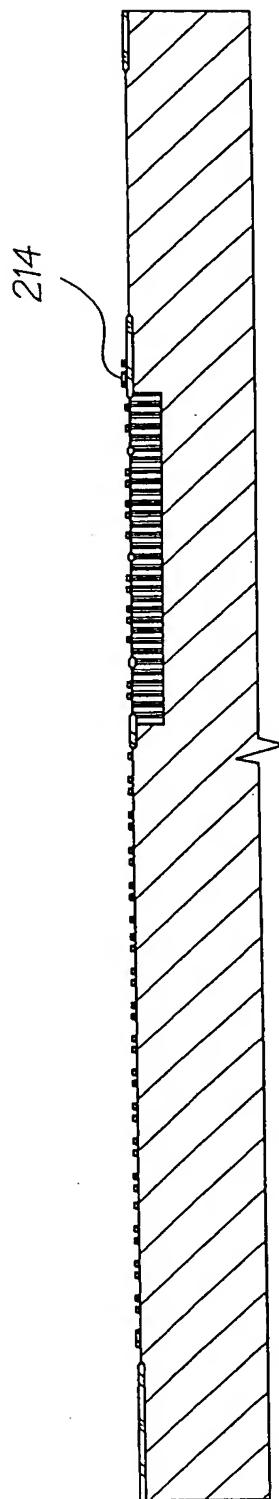


FIG. 24



Poly mask

FIG. 25



Deposit poly

FIG. 26

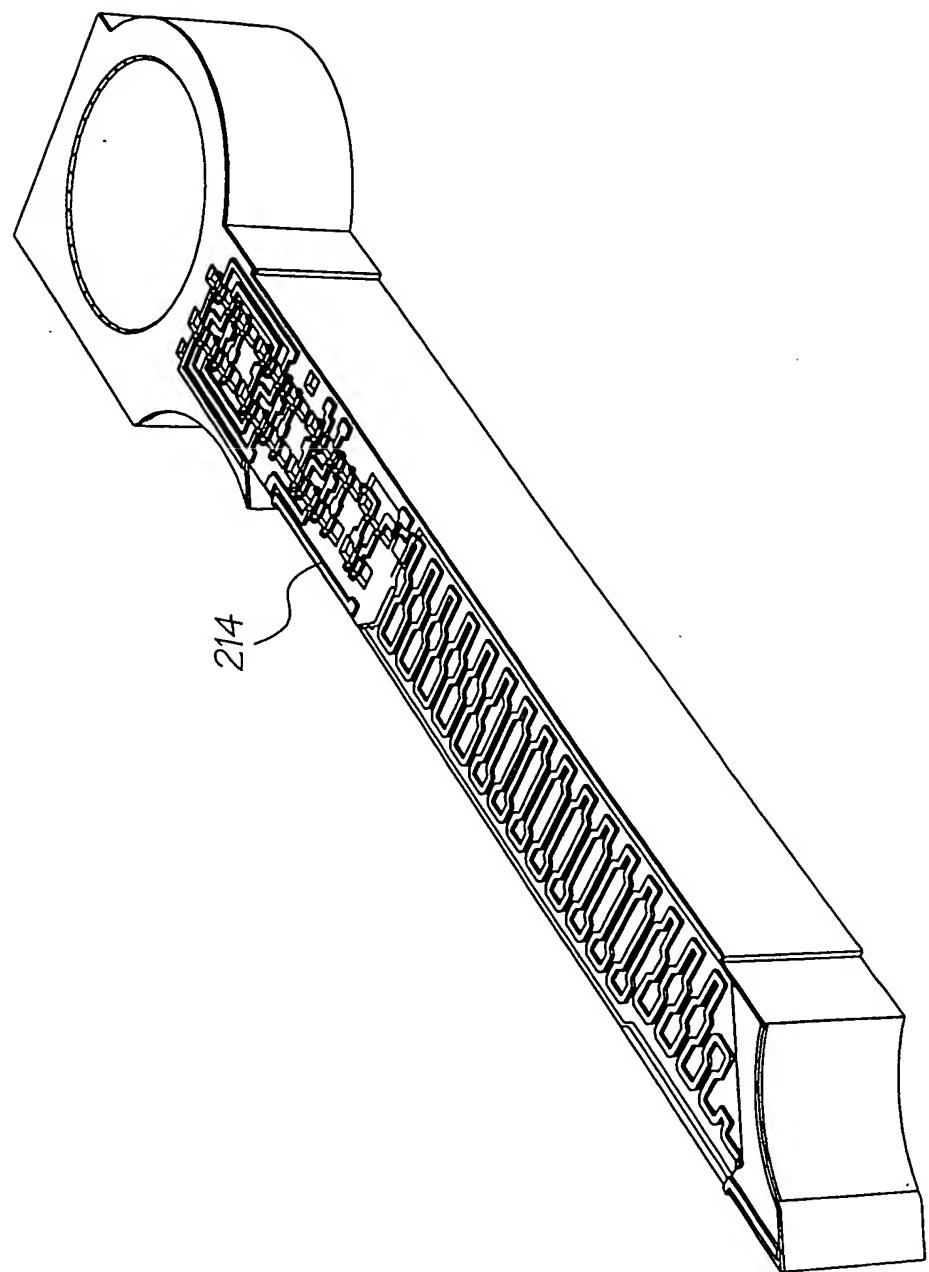
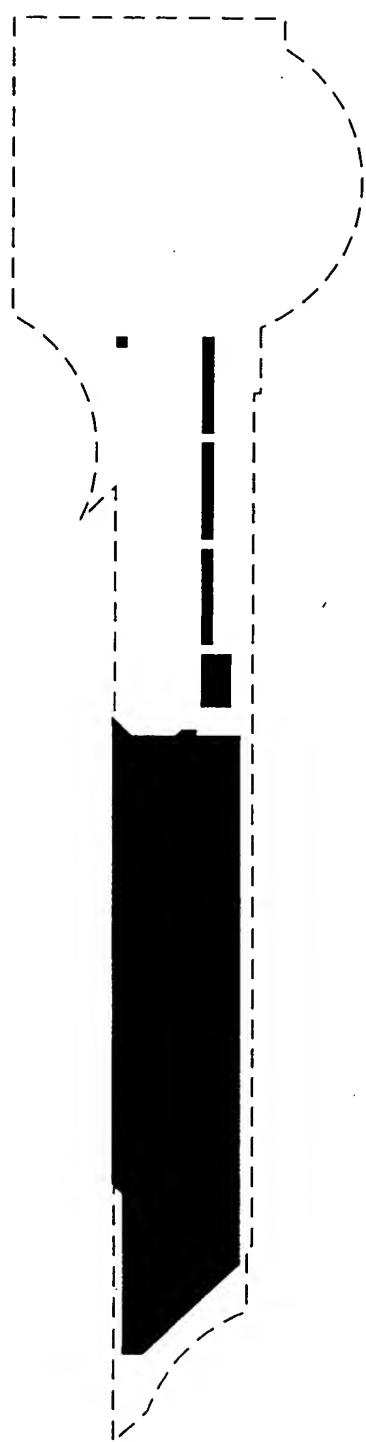
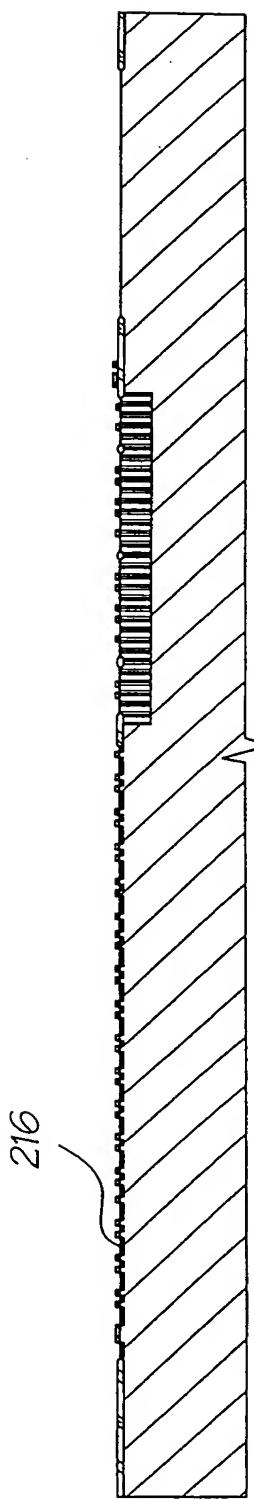


FIG. 27



$n+$ mask

FIG. 28



$n+$ implant

FIG. 29

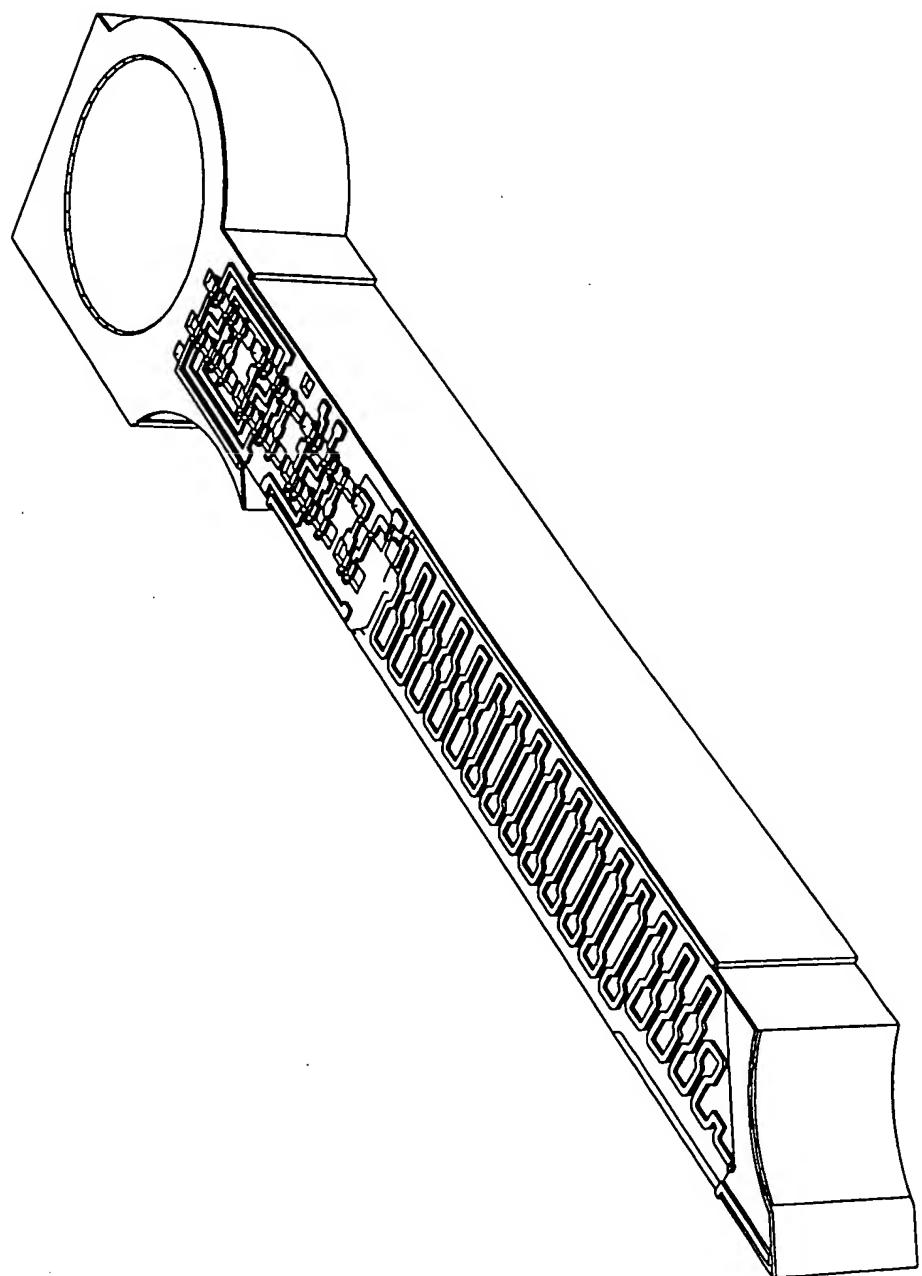


FIG. 30

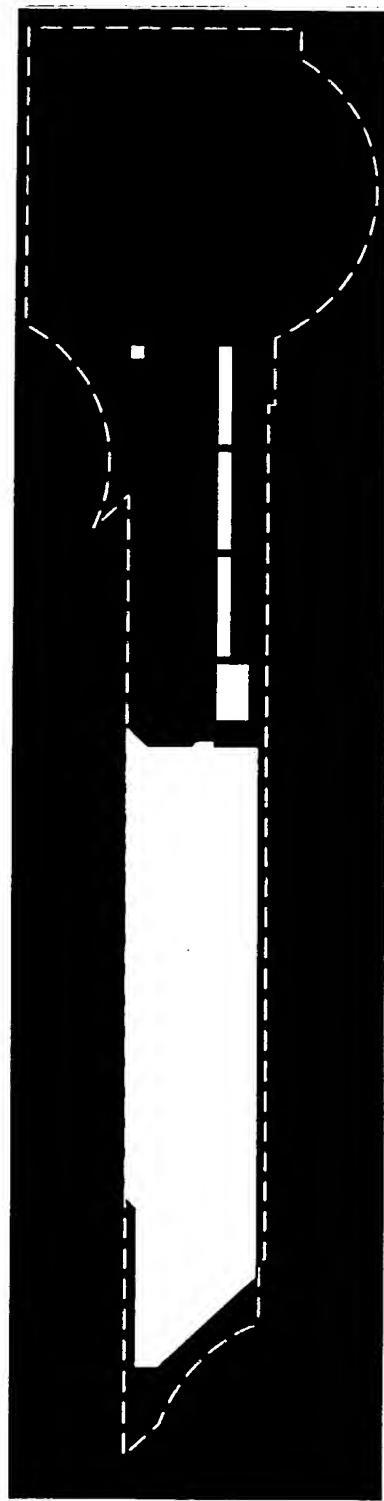


FIG. 31

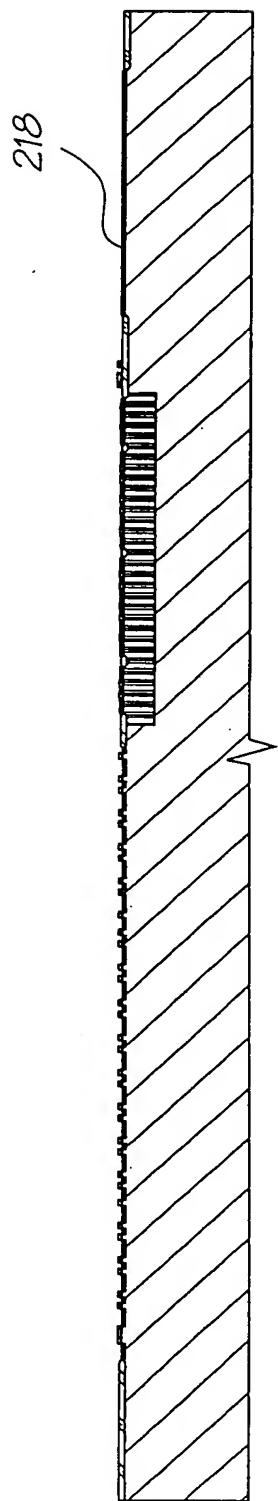


FIG. 32

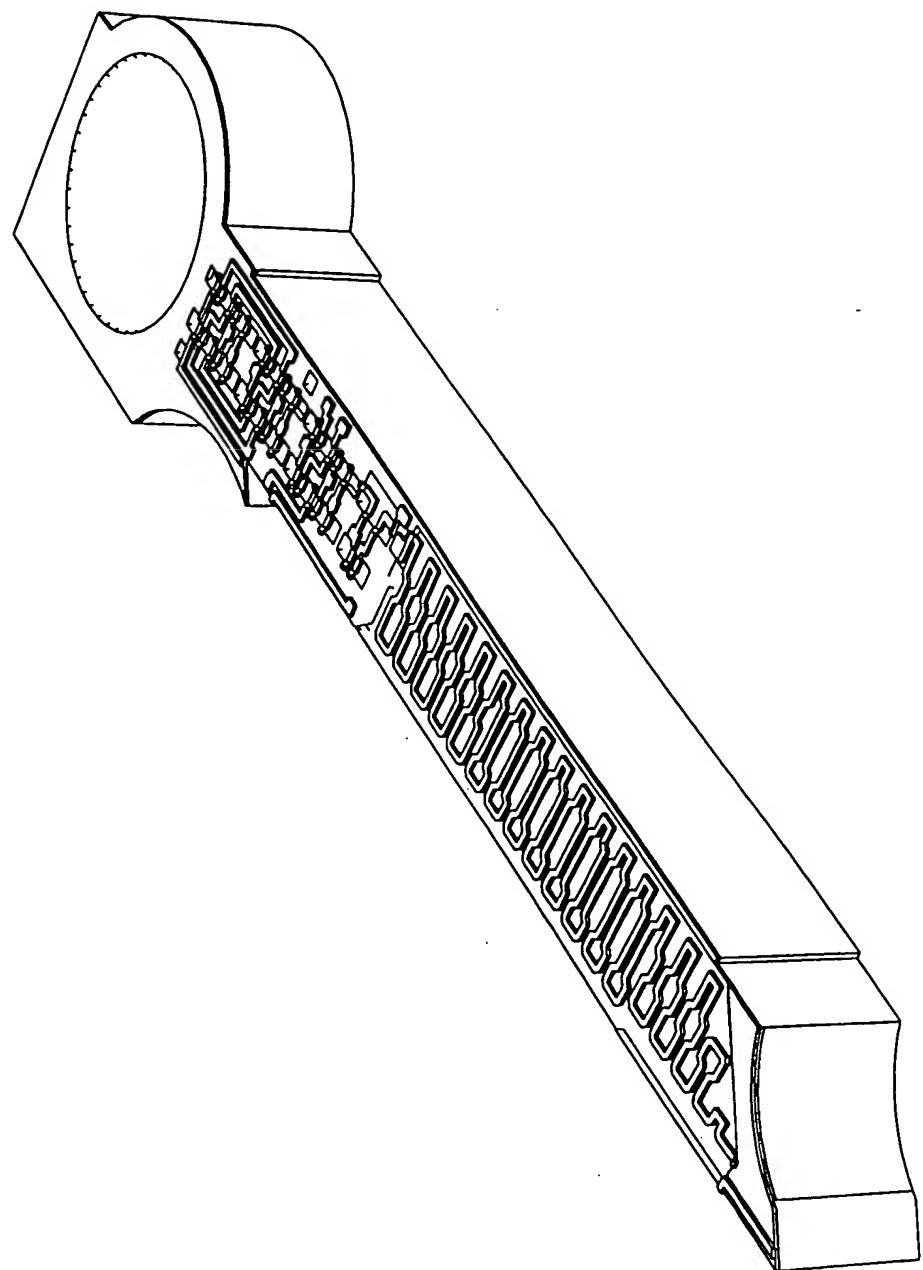
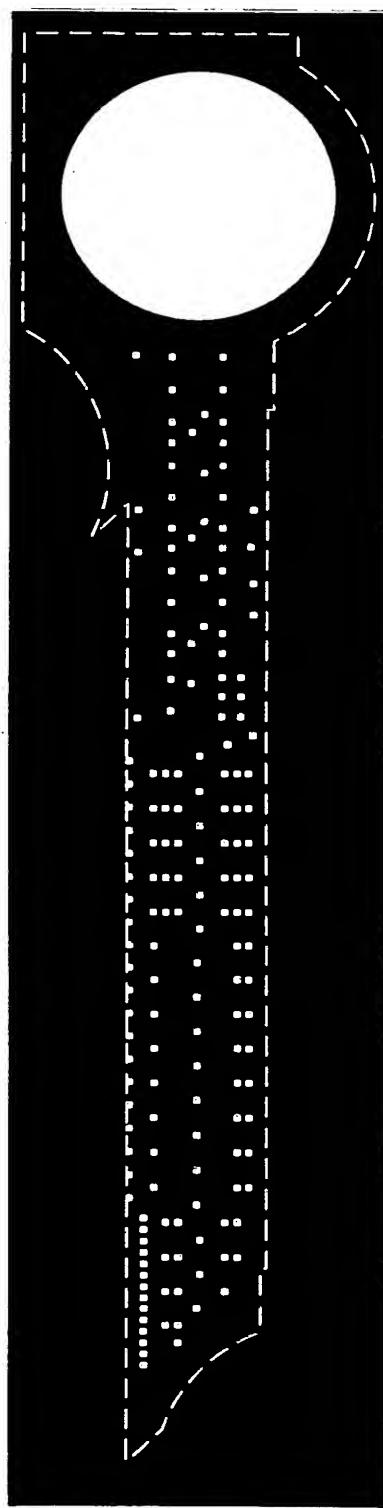
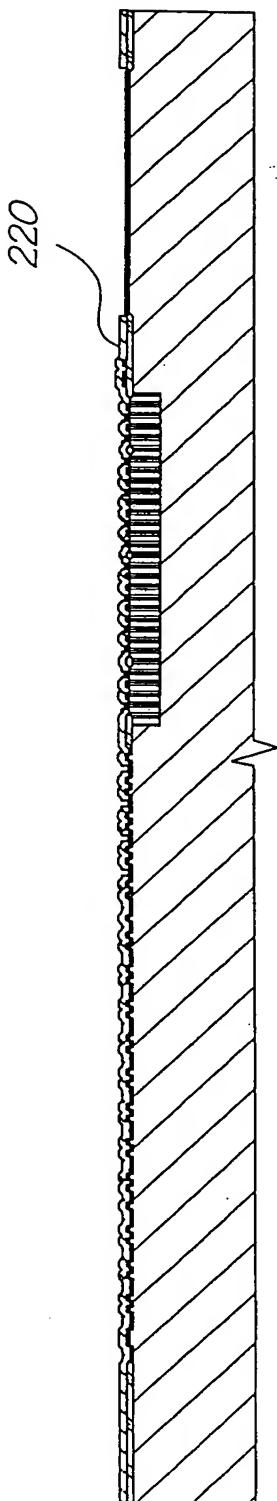


FIG. 33



Contacts mask

FIG. 34



Deposit ILD 1, etch contacts

FIG. 35

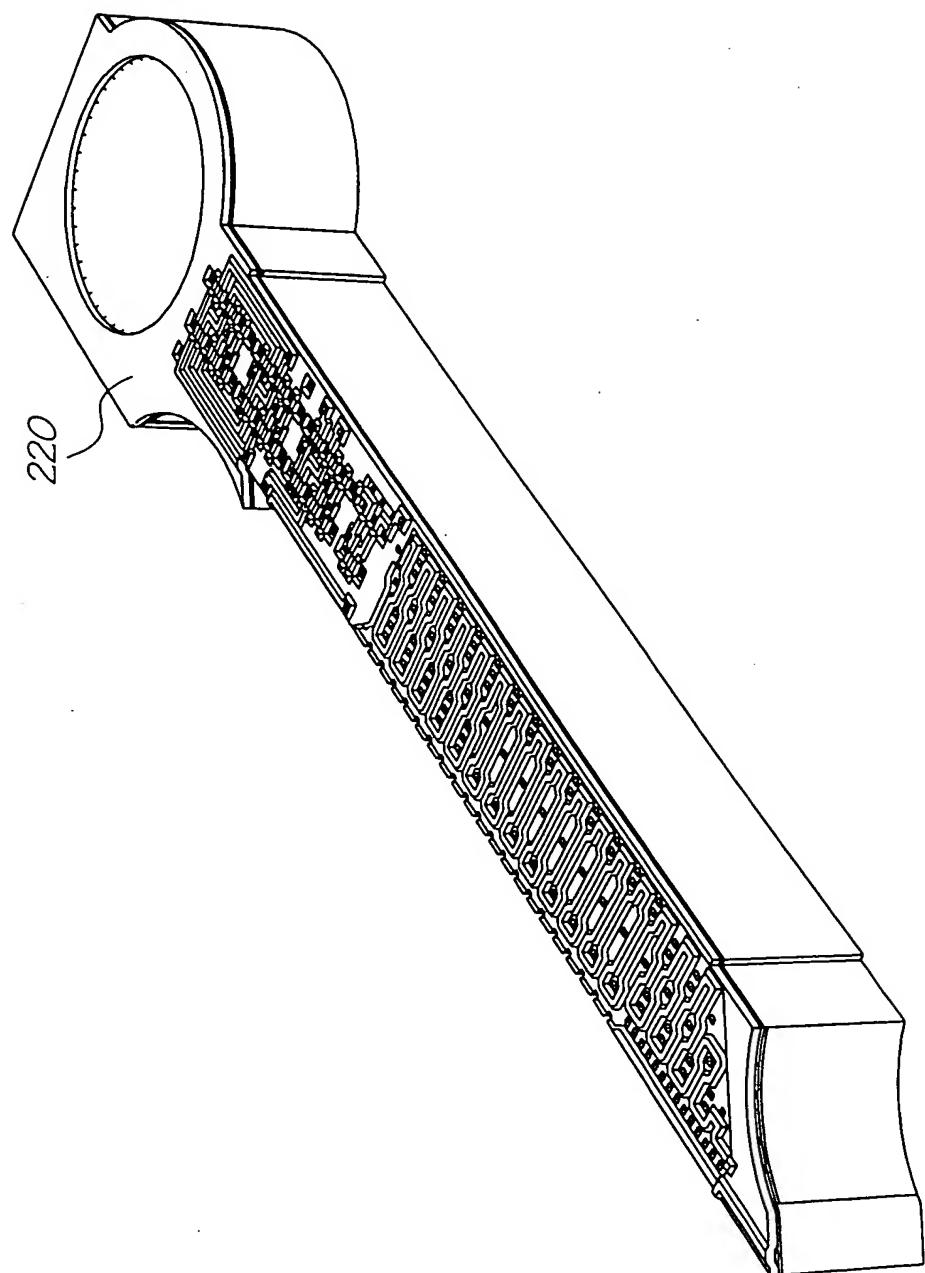
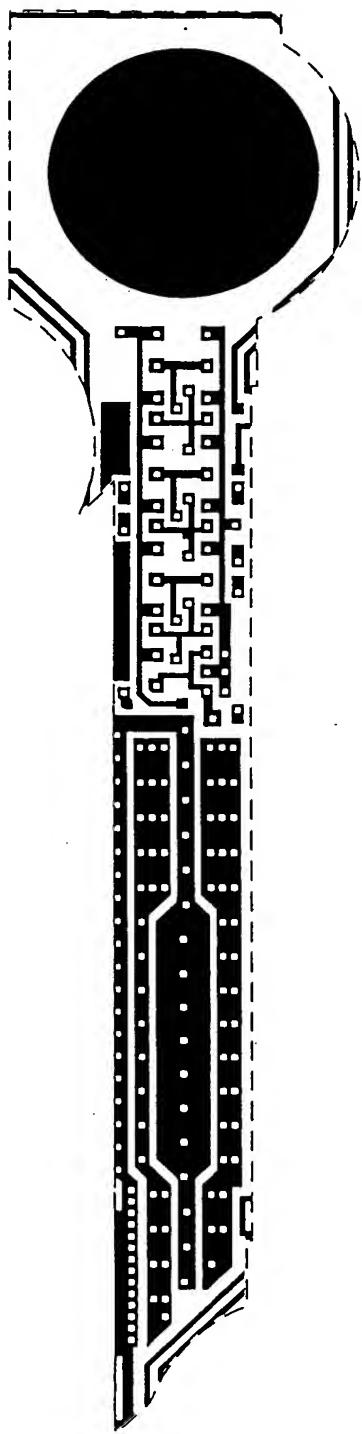
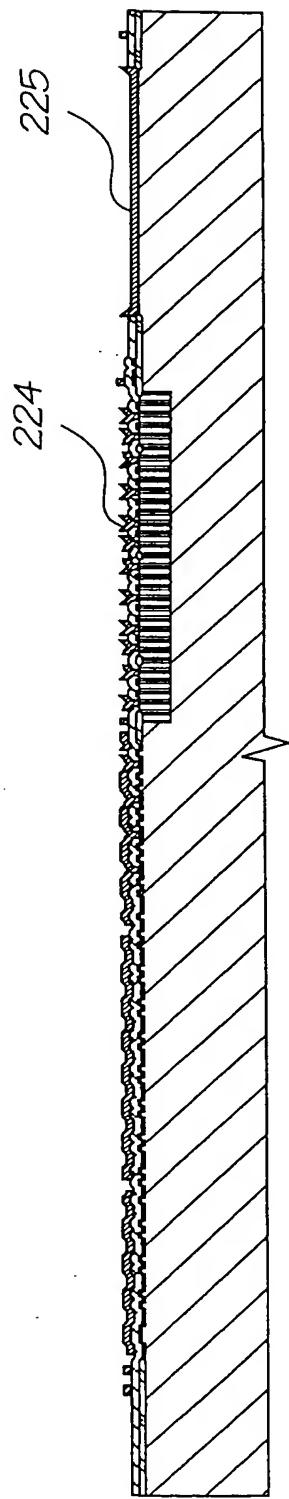


FIG. 36



Metal 1 mask

FIG. 37



Deposit Metal 1

FIG. 38

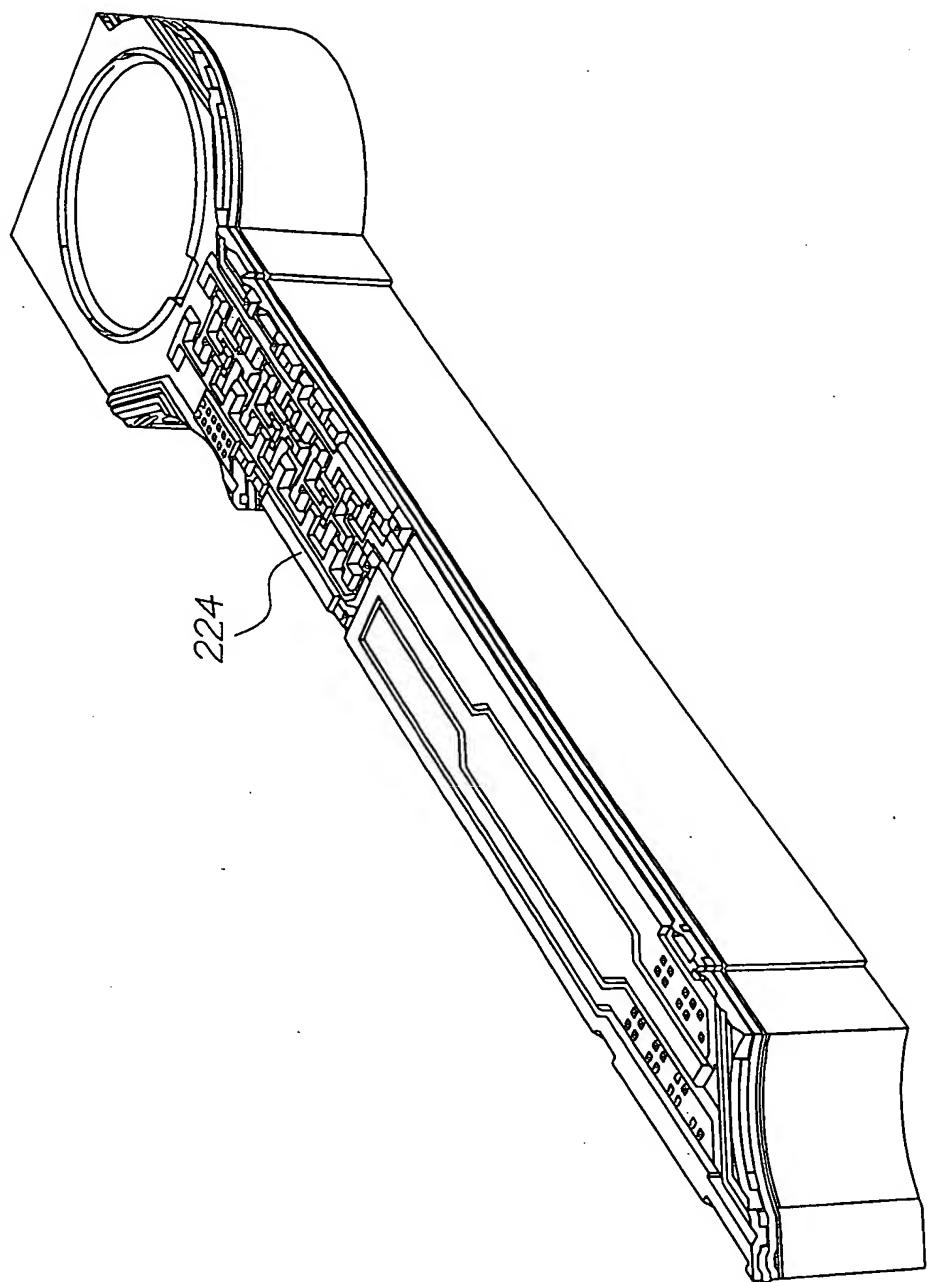
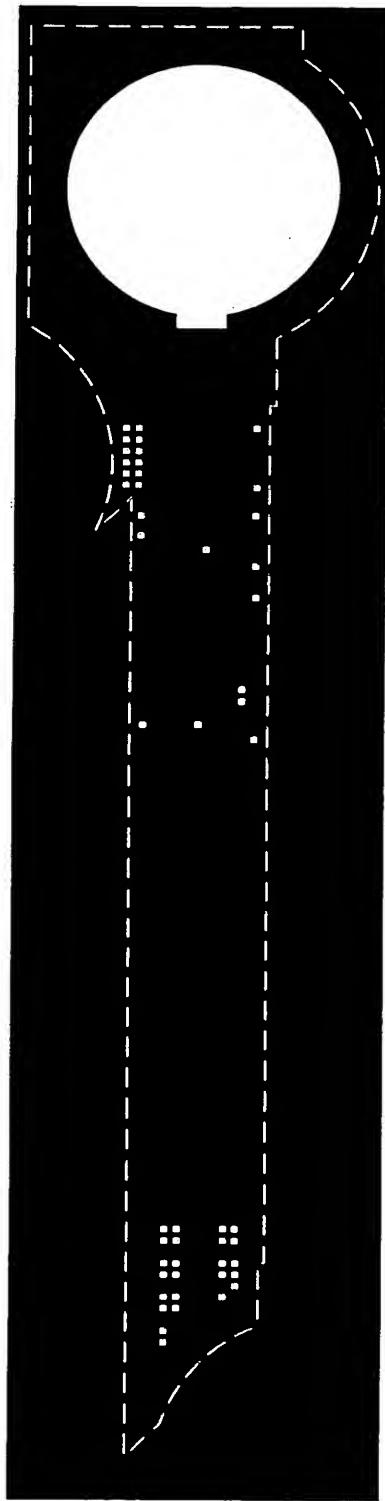
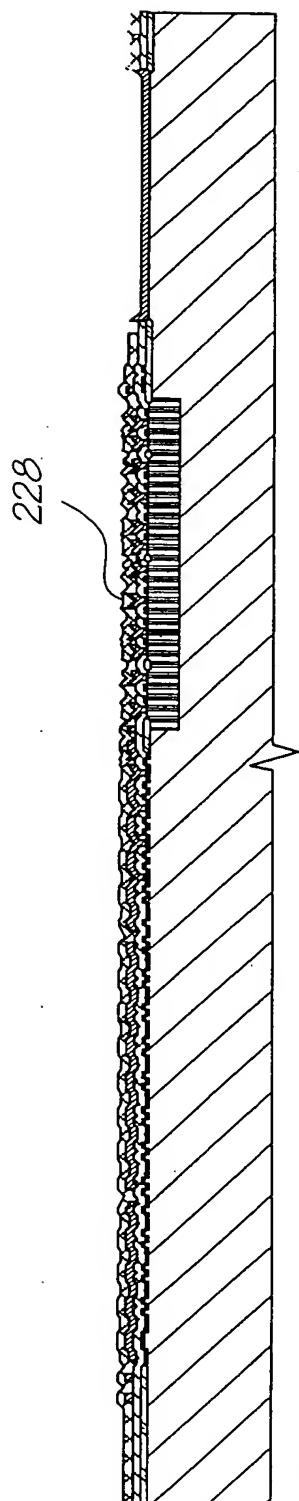


FIG. 39



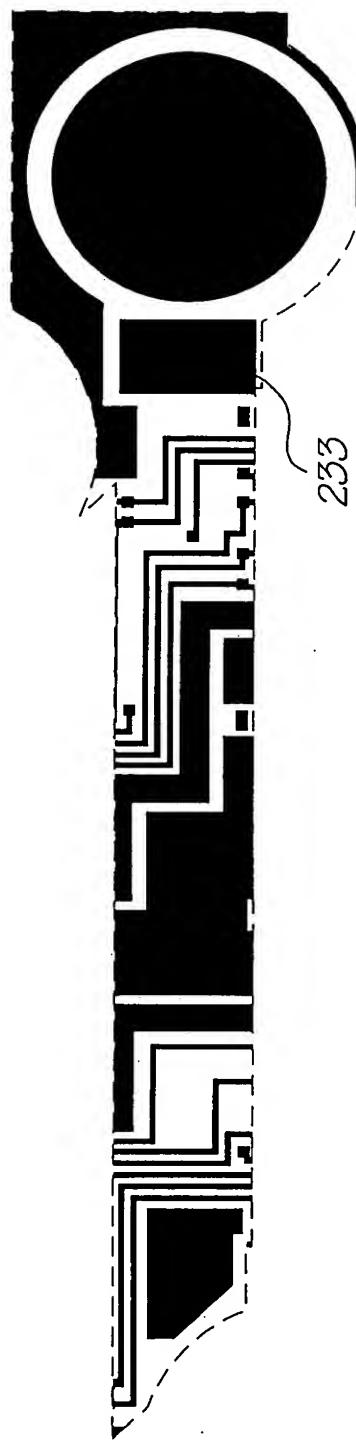
Via 1 mask

FIG. 40



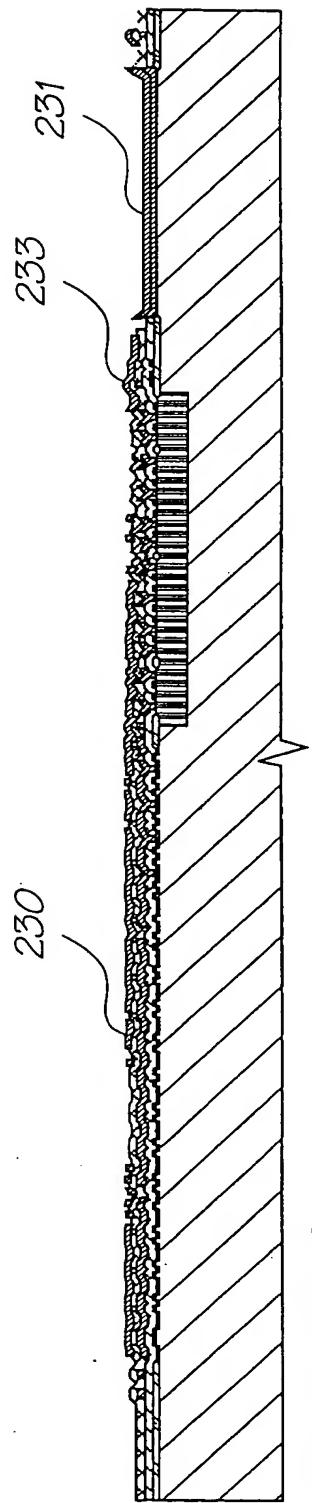
Deposit ILD 2, etch vias

FIG. 41



Metal 2 mask

FIG. 42



Deposit metal 2

FIG. 43

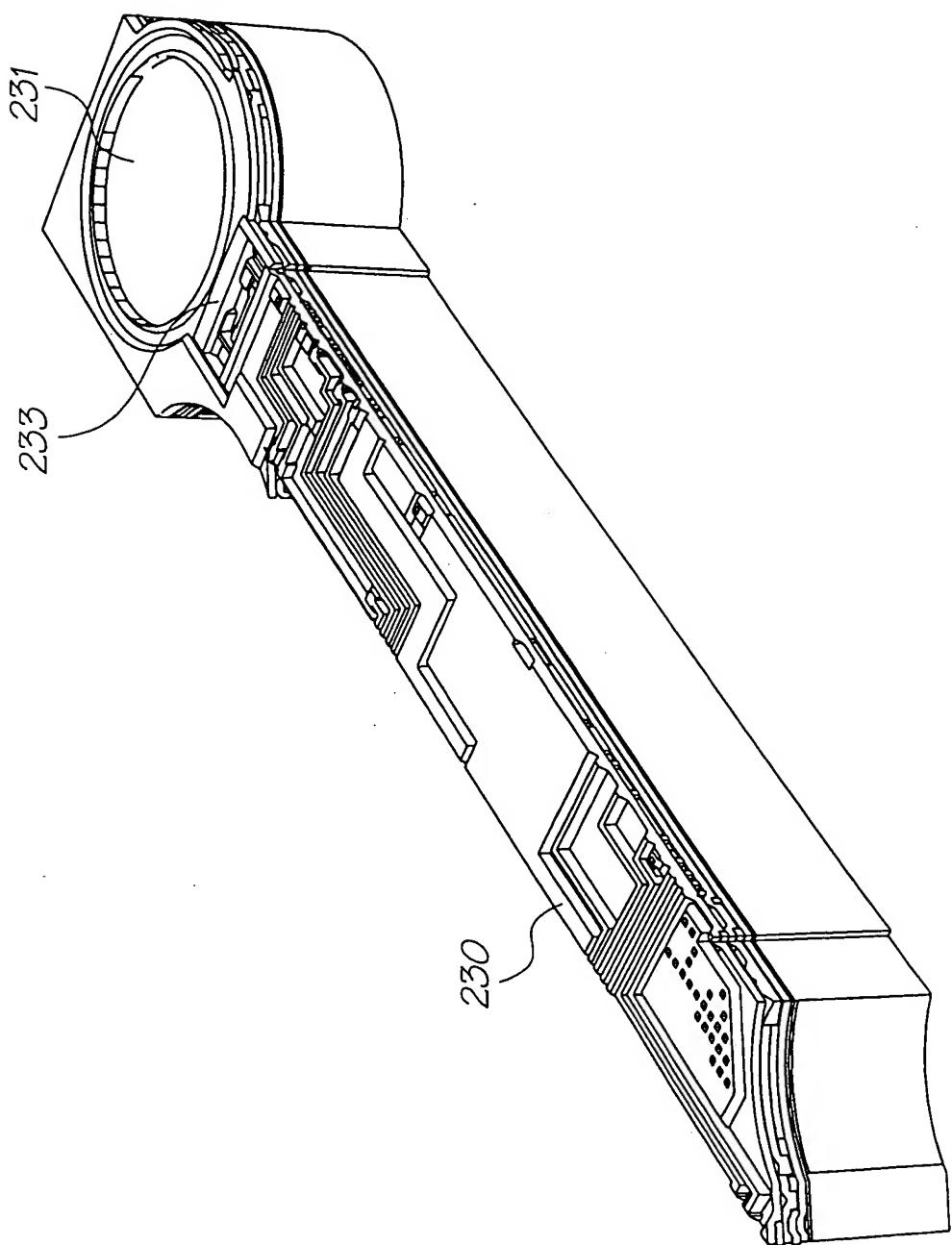
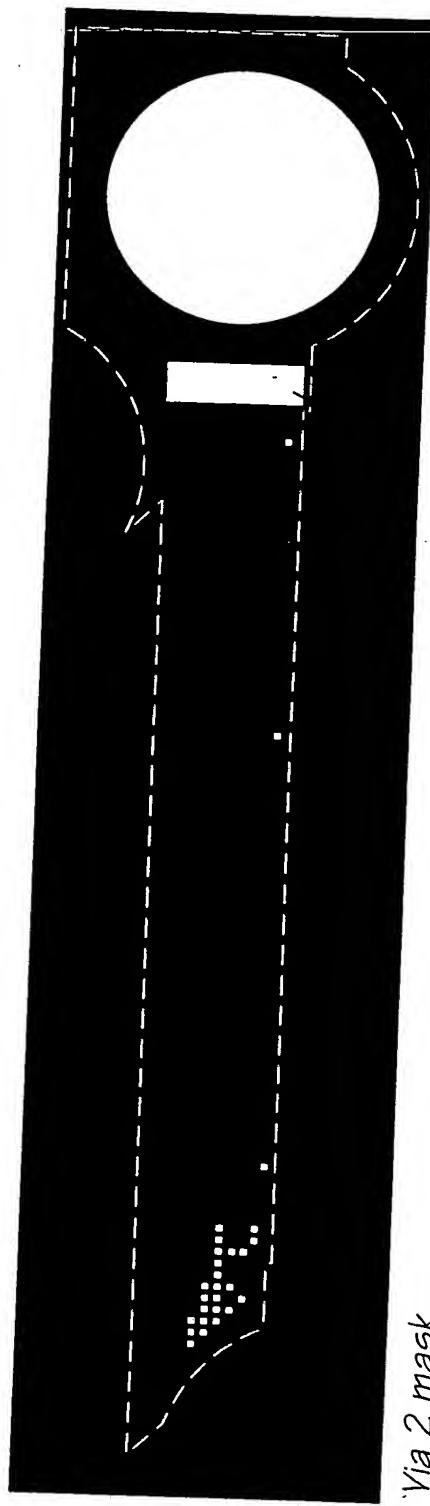
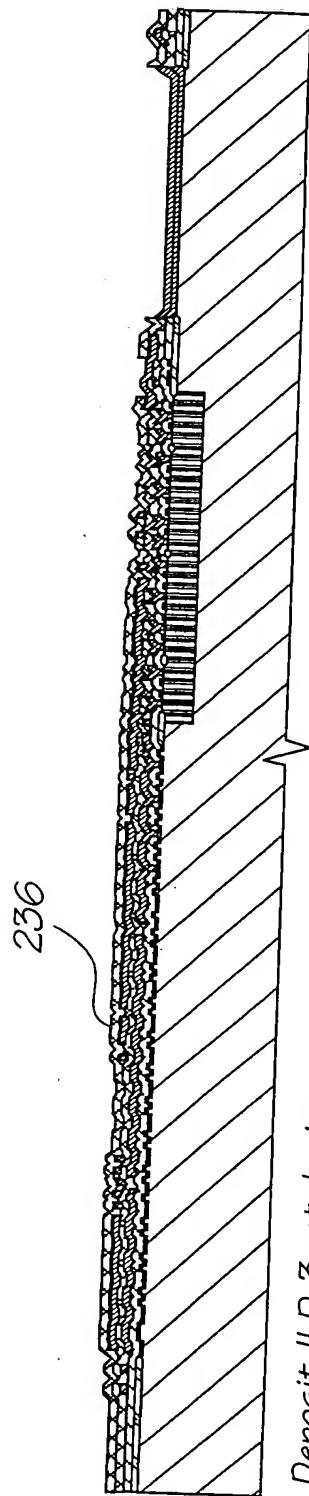


FIG. 44



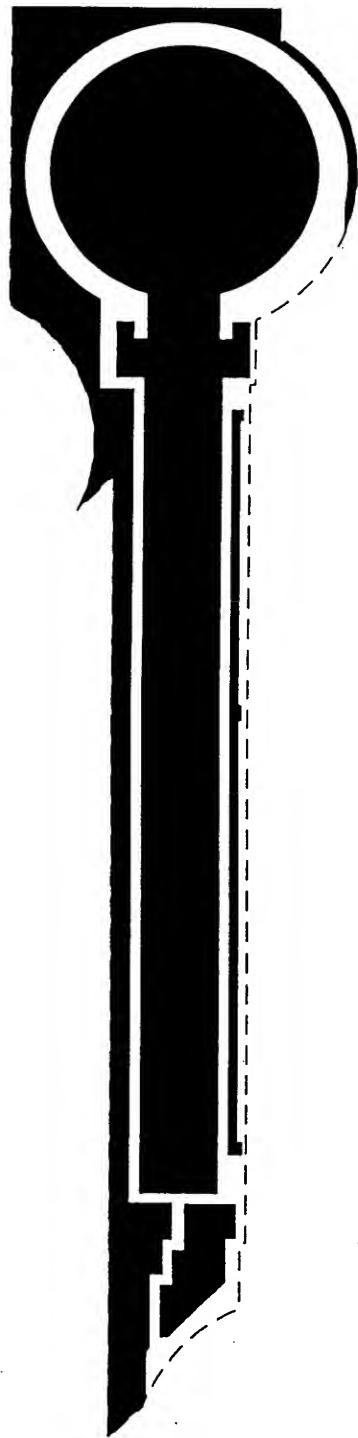
Via 2 mask

FIG. 45



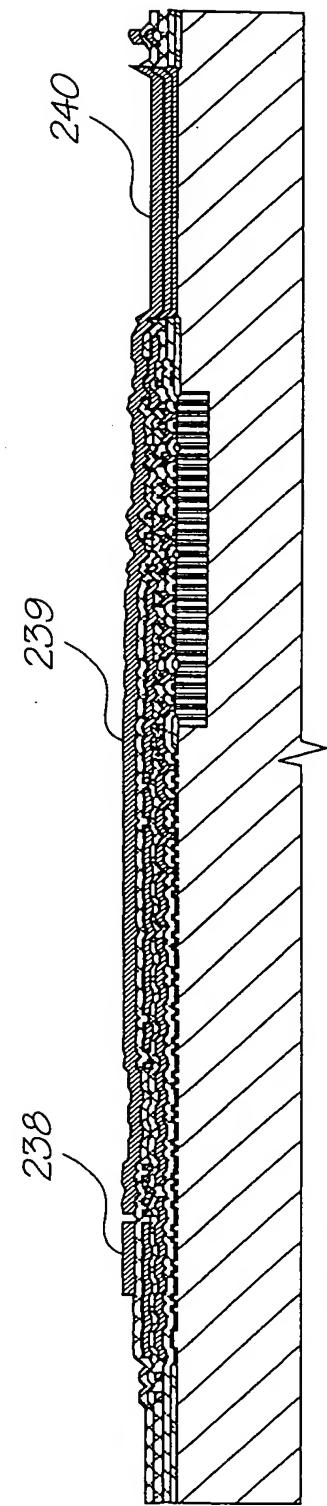
Deposit ILD 3, etch vias

FIG. 46



Metal 3 mask

FIG. 47



Deposit metal 3

FIG. 48

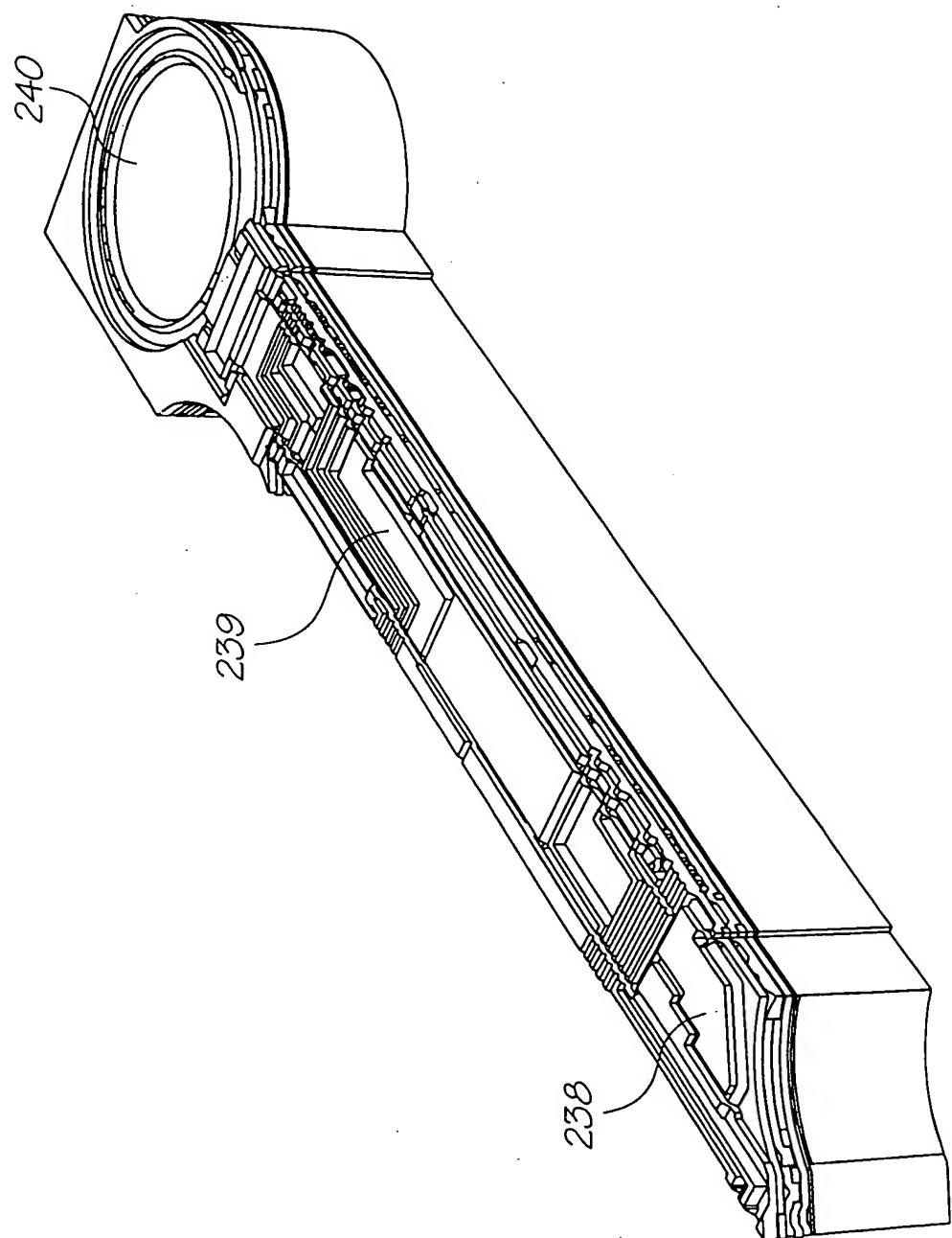
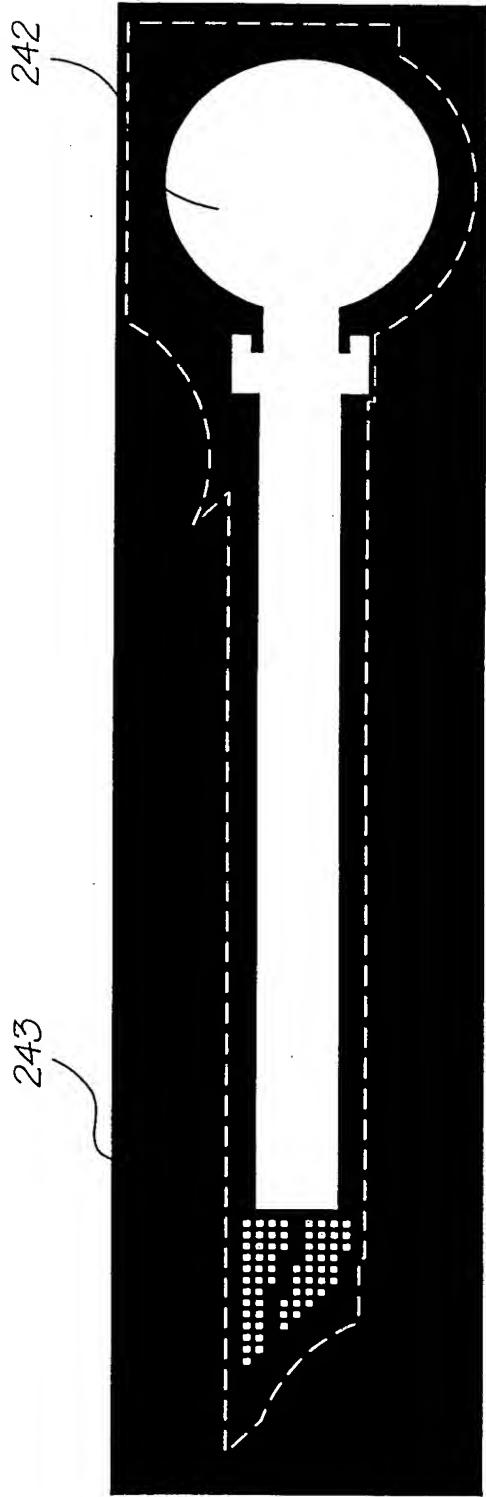
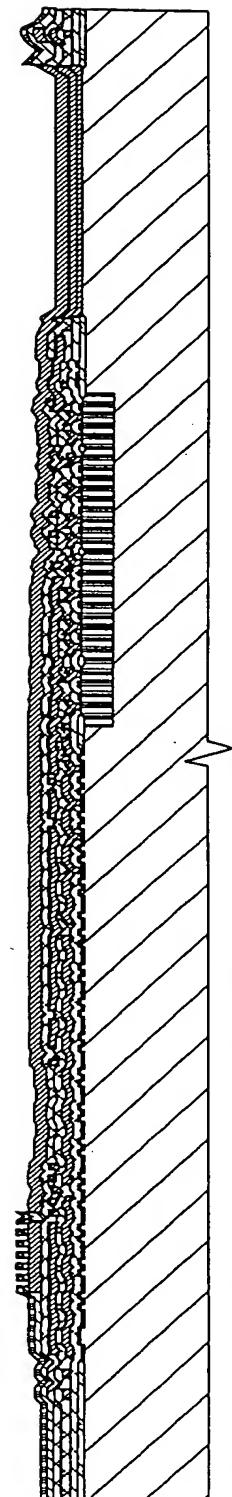


FIG. 49



Via 3 / Passivation mask

FIG. 50



Deposit passivation oxide & nitride, etch vias

FIG. 51

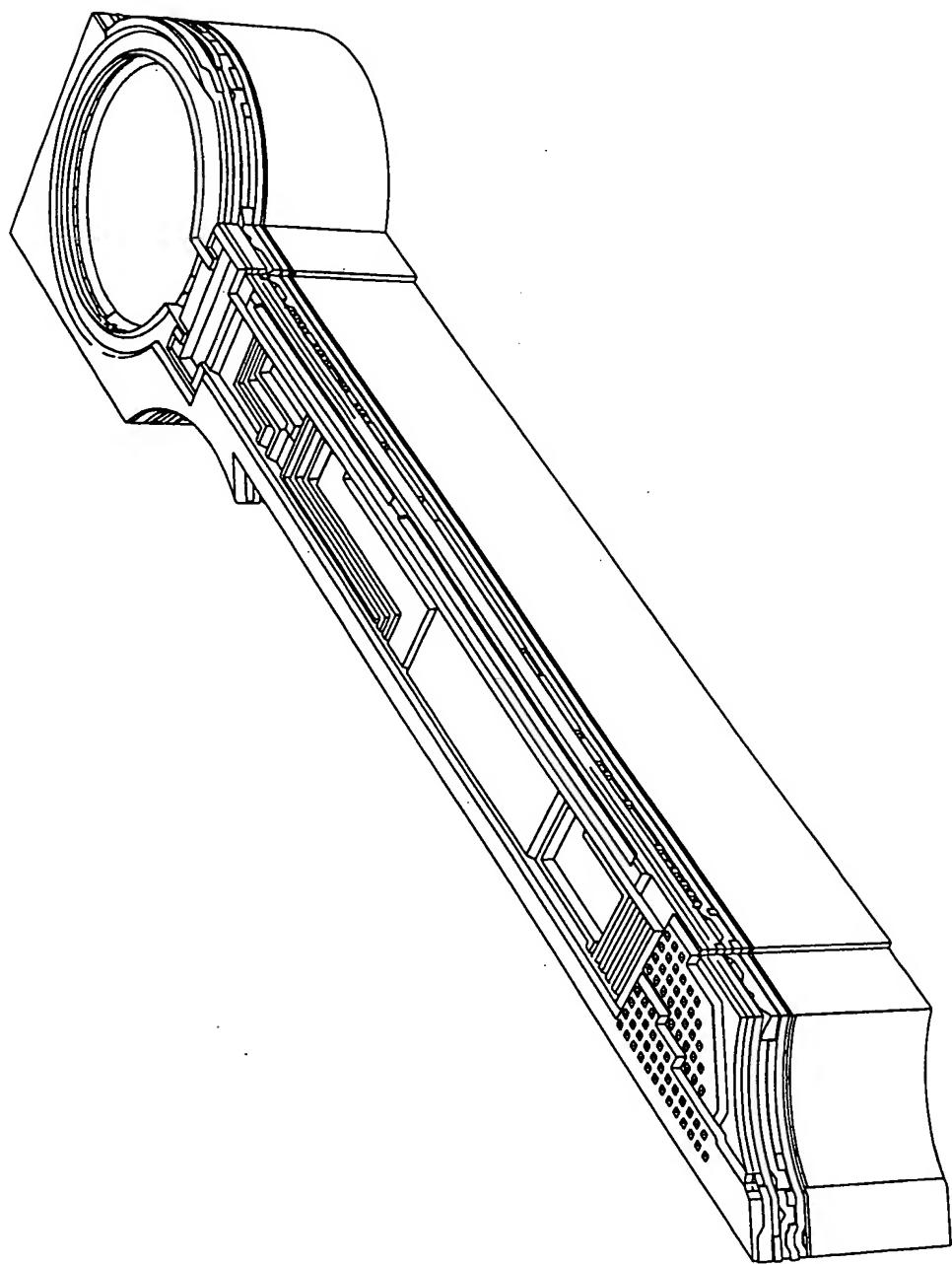
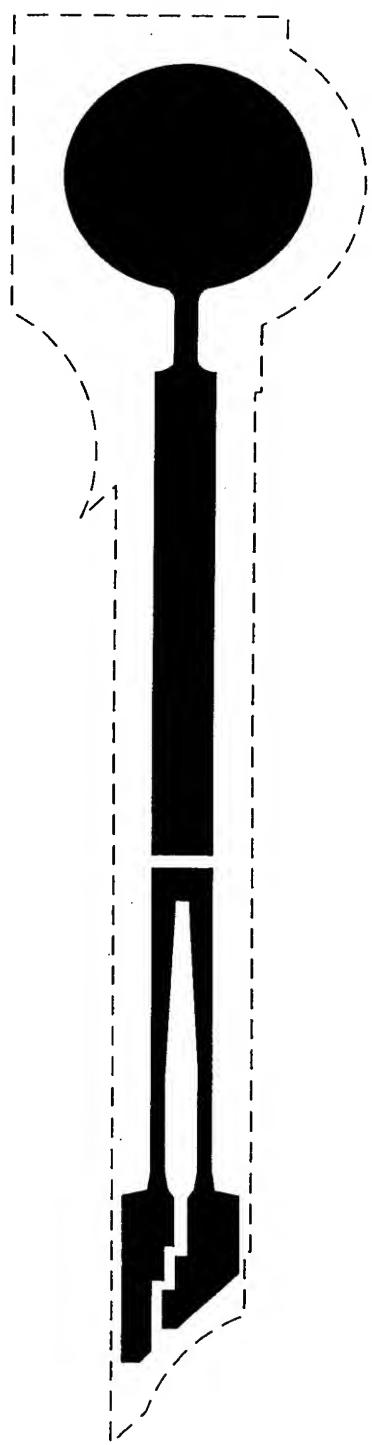
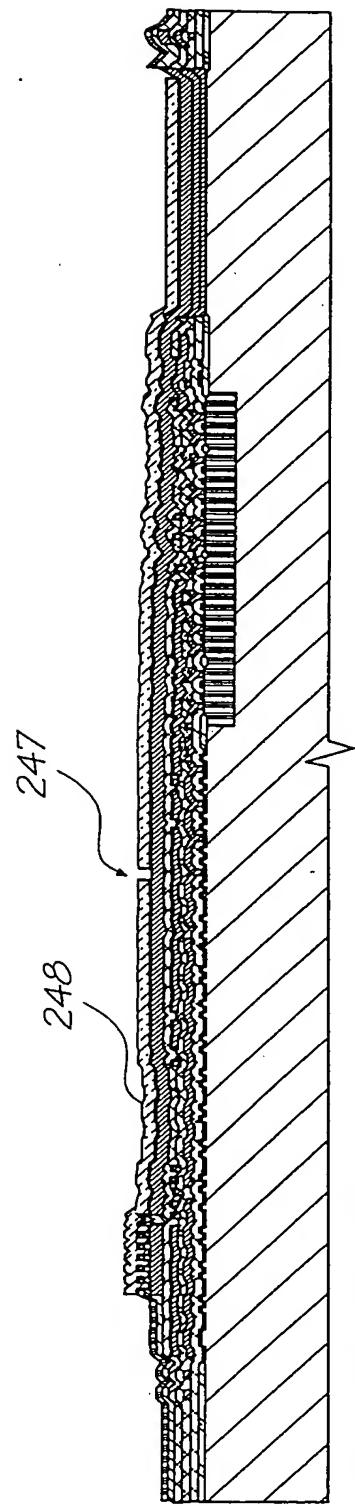


FIG. 52



Heater mask

FIG. 53



Deposit heater TiN

FIG. 54

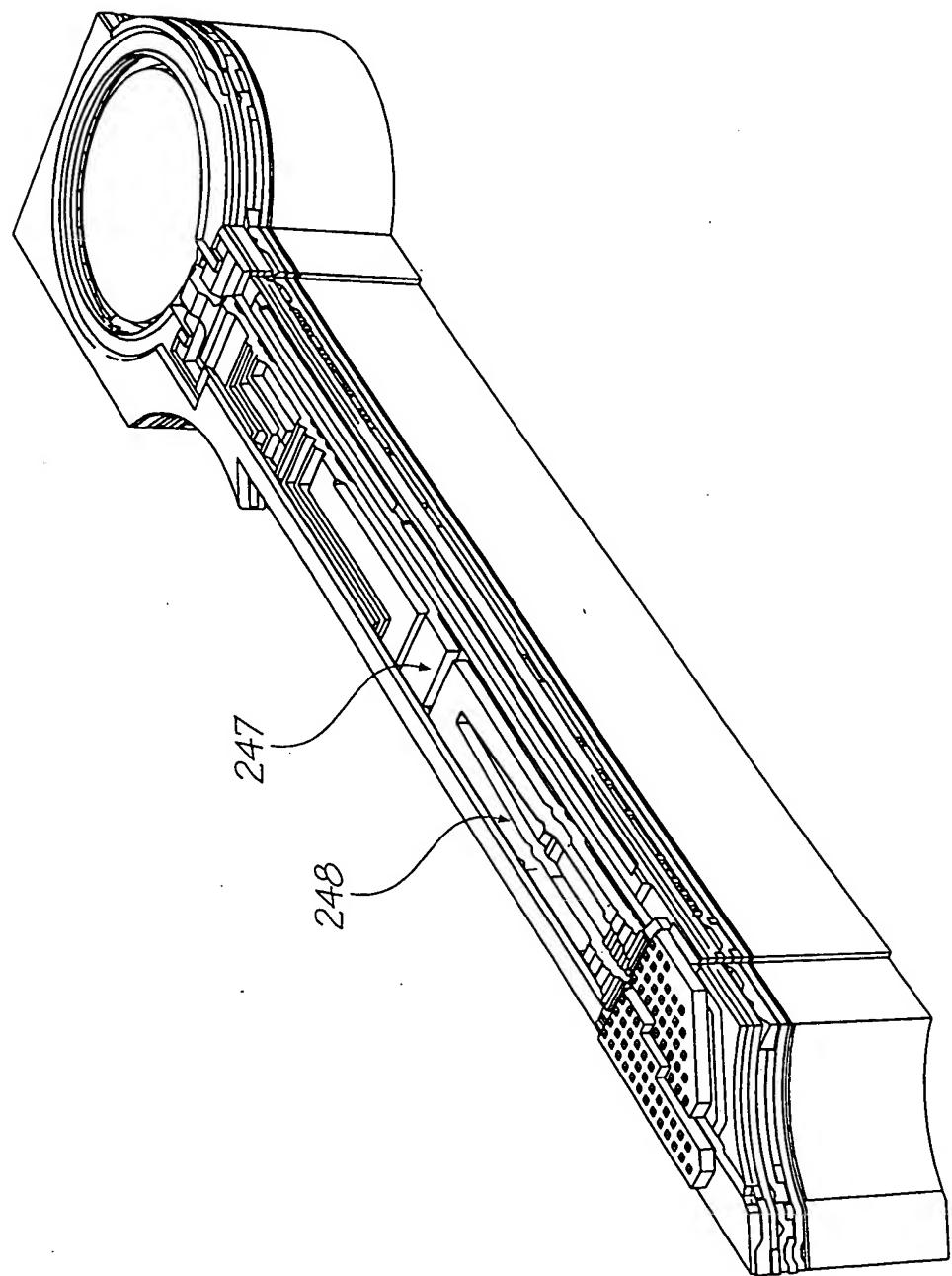


FIG. 55

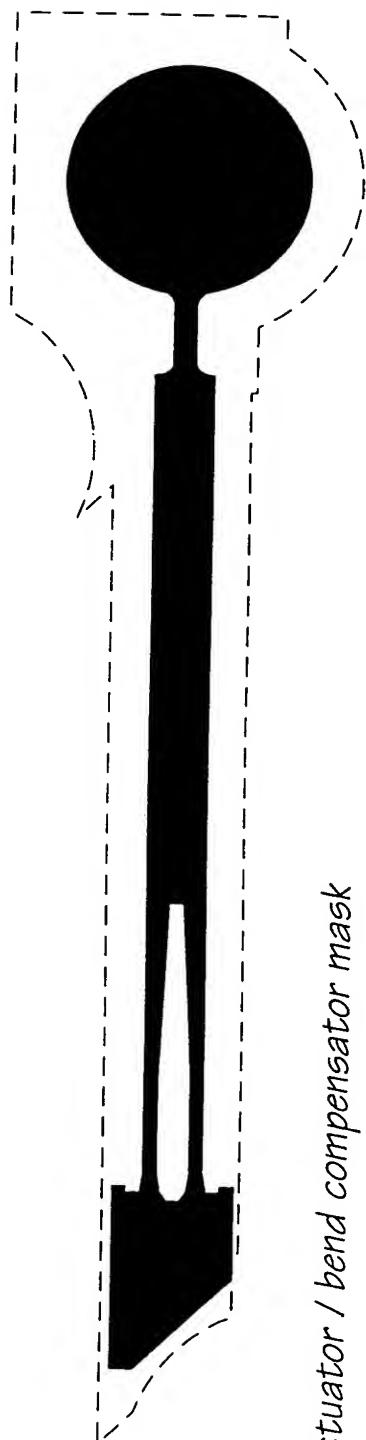
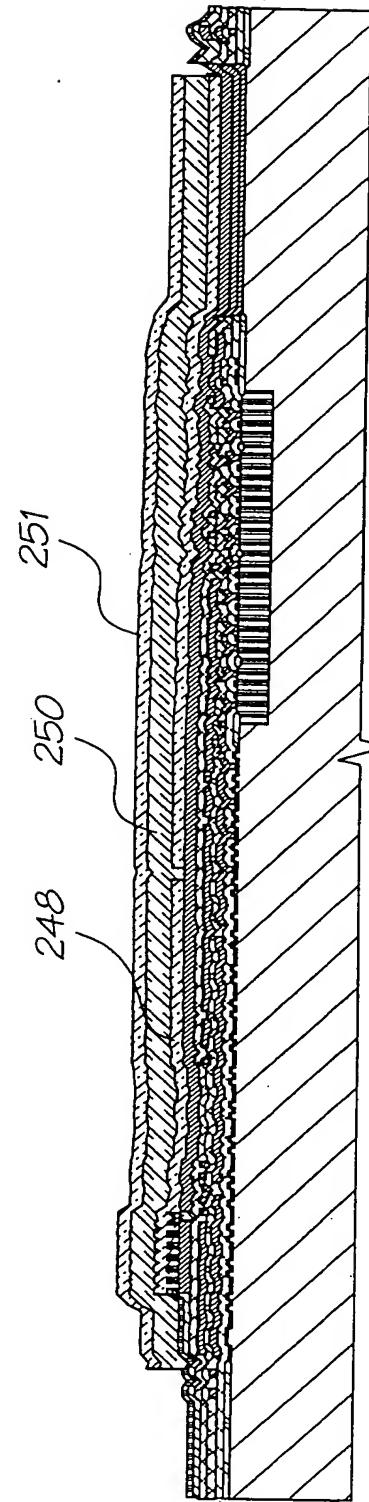


FIG. 56



Deposit actuator glass and bend compensator TiN, etch together

FIG. 57

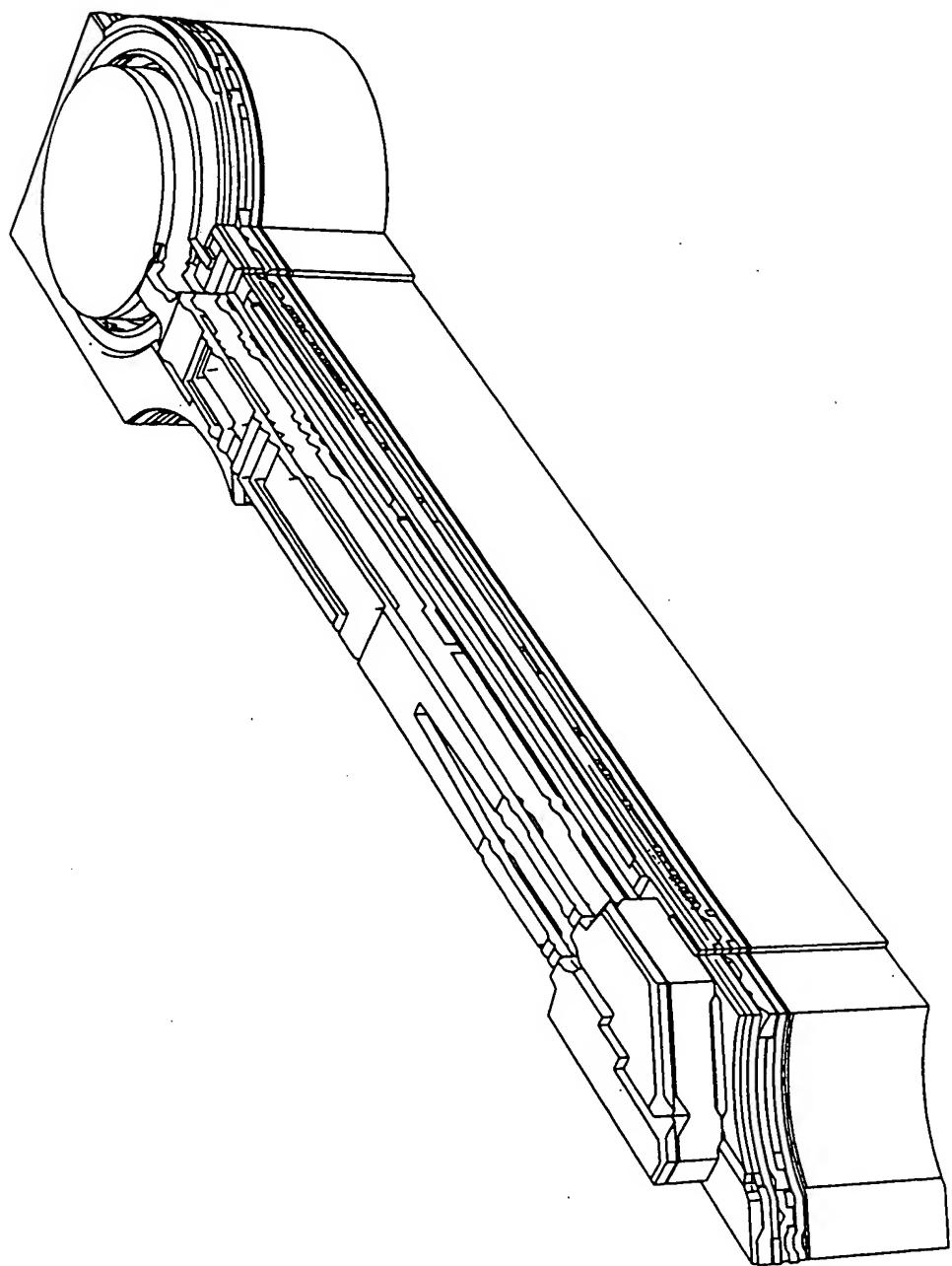


FIG. 58

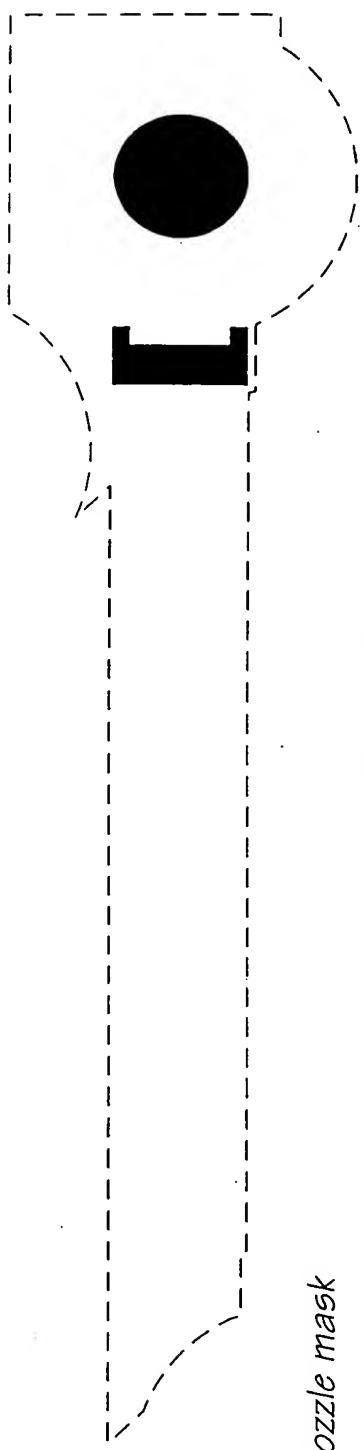


FIG. 59
Nozzle mask

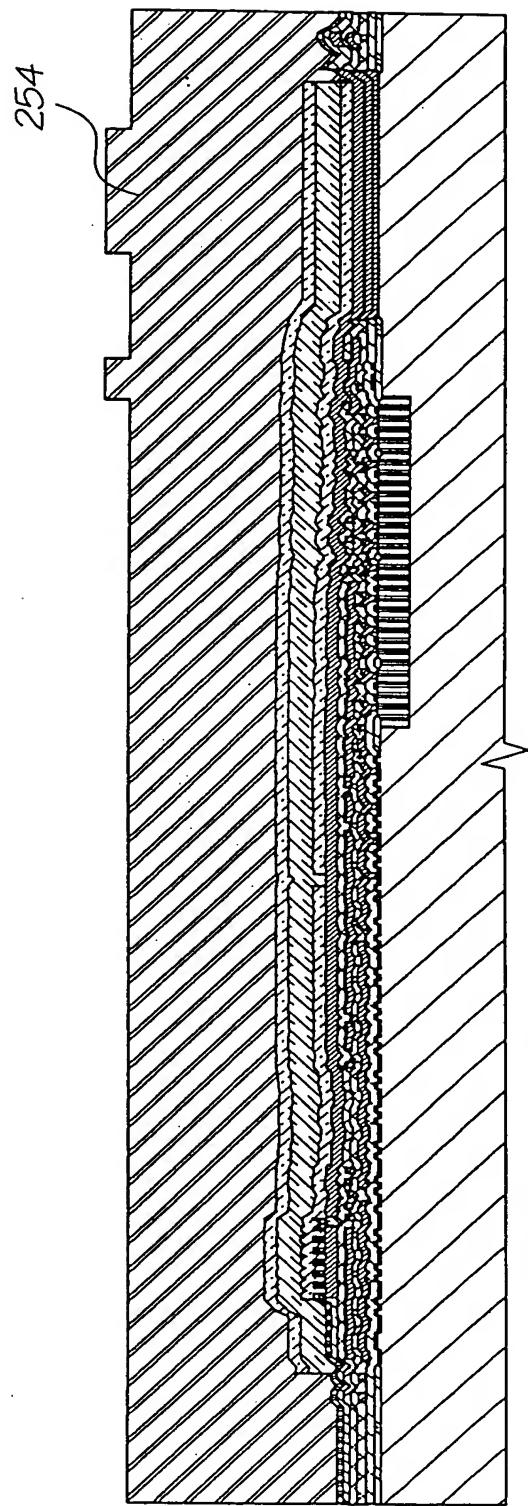


FIG. 60
Deposit sacrificial layer, etch nozzles

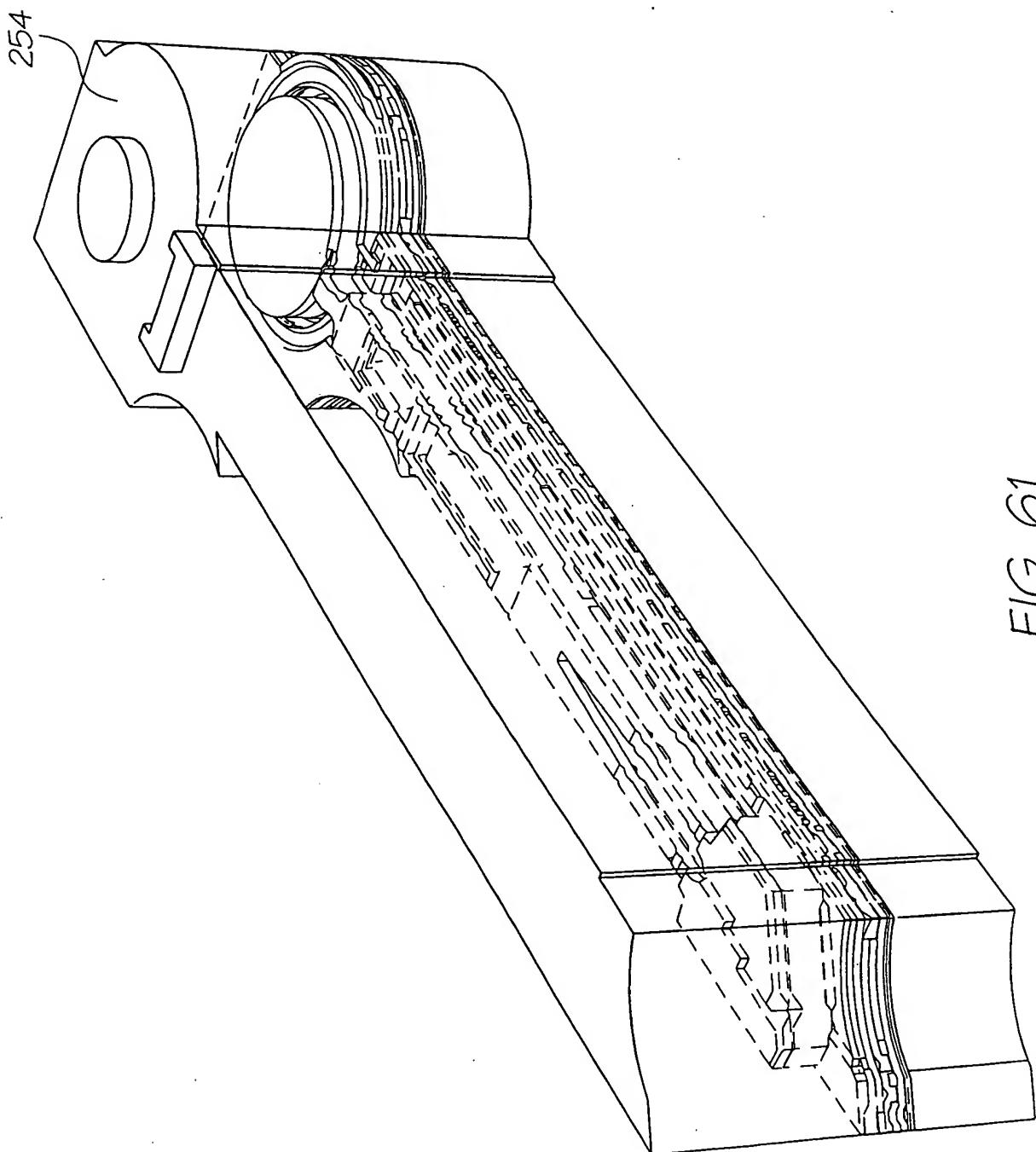
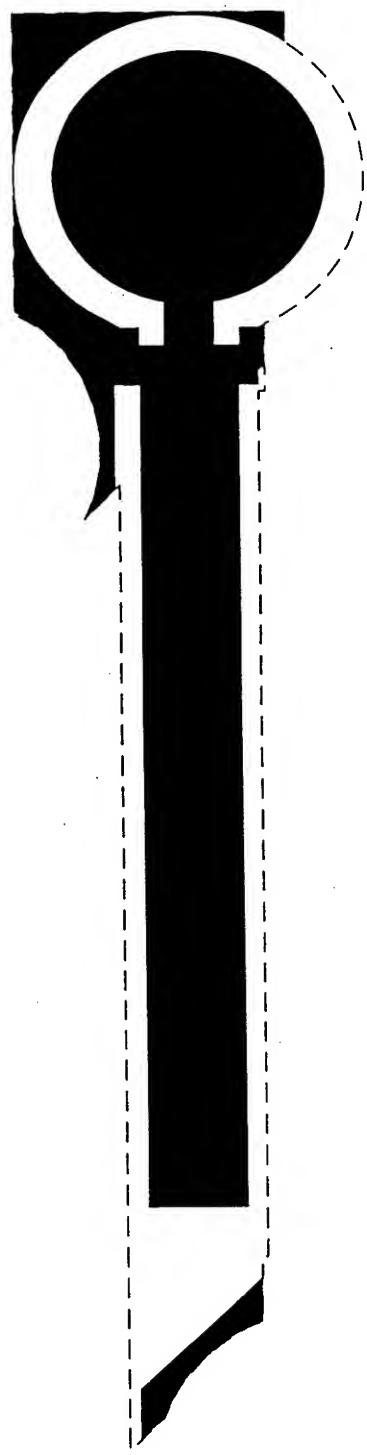


FIG. 61

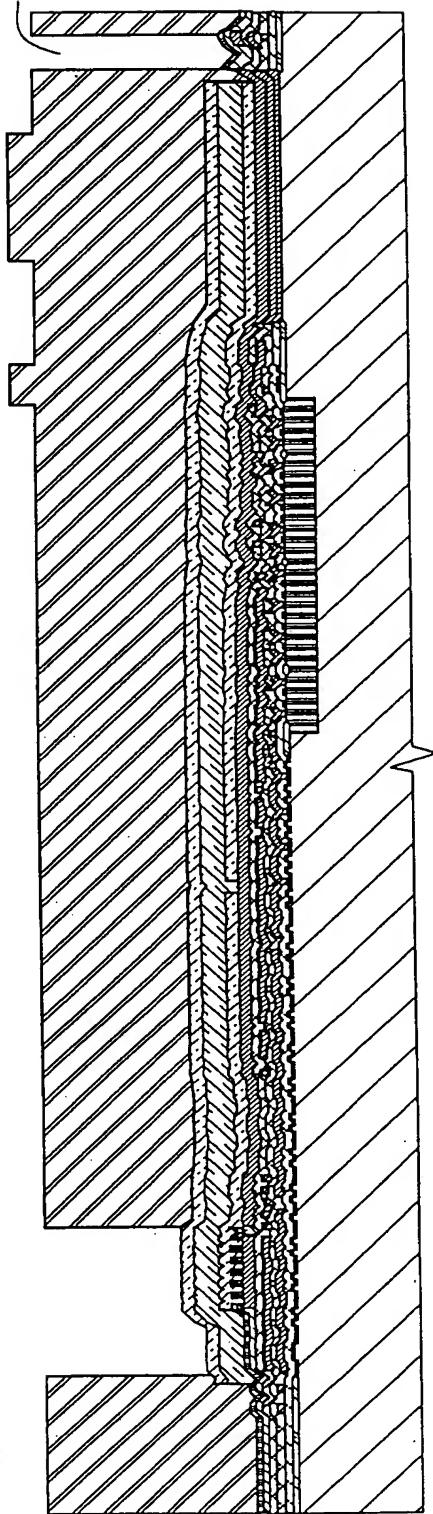


Chamber mask

FIG. 62

39/76

255



Etch chambers in sacrificial layer

FIG. 63

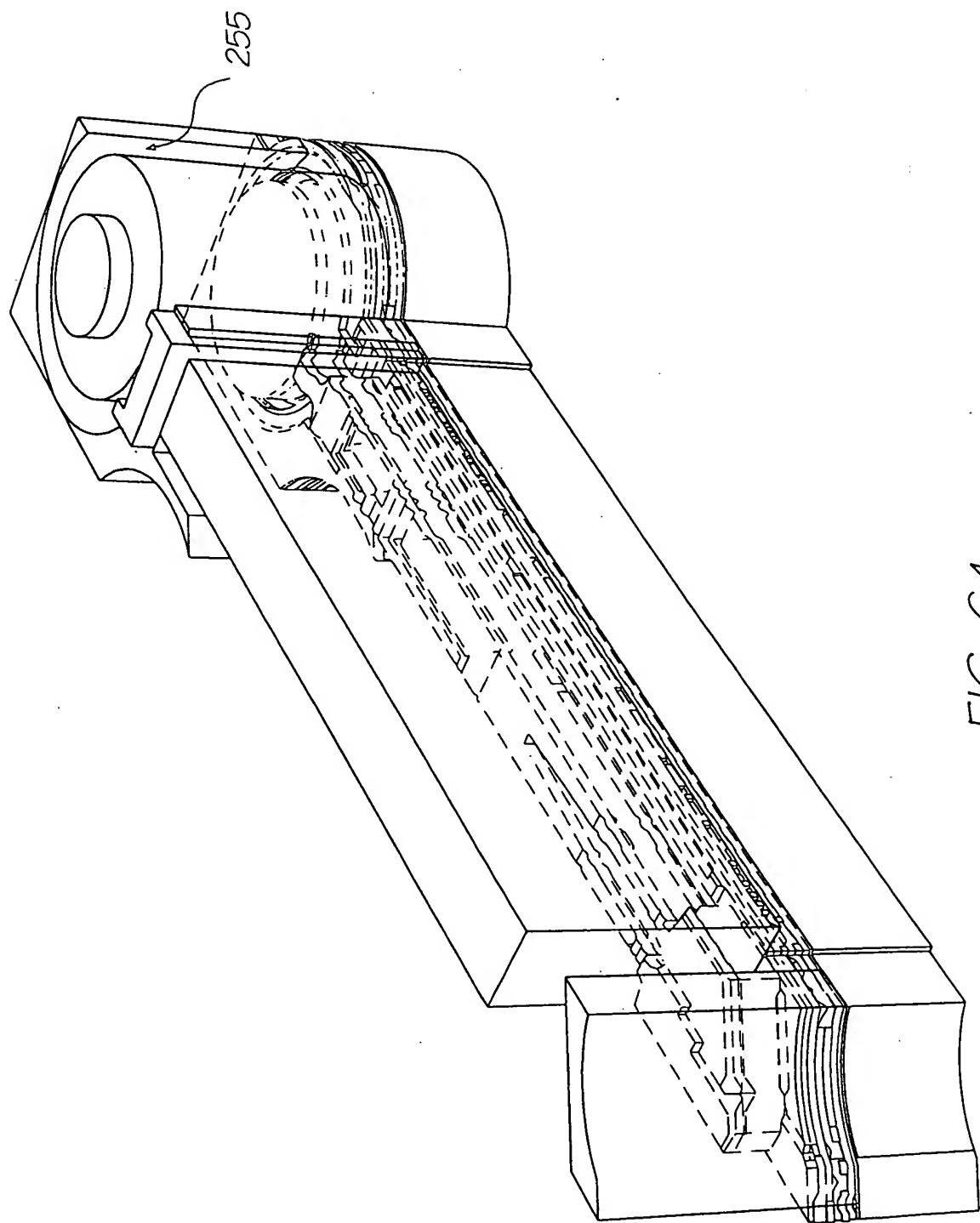
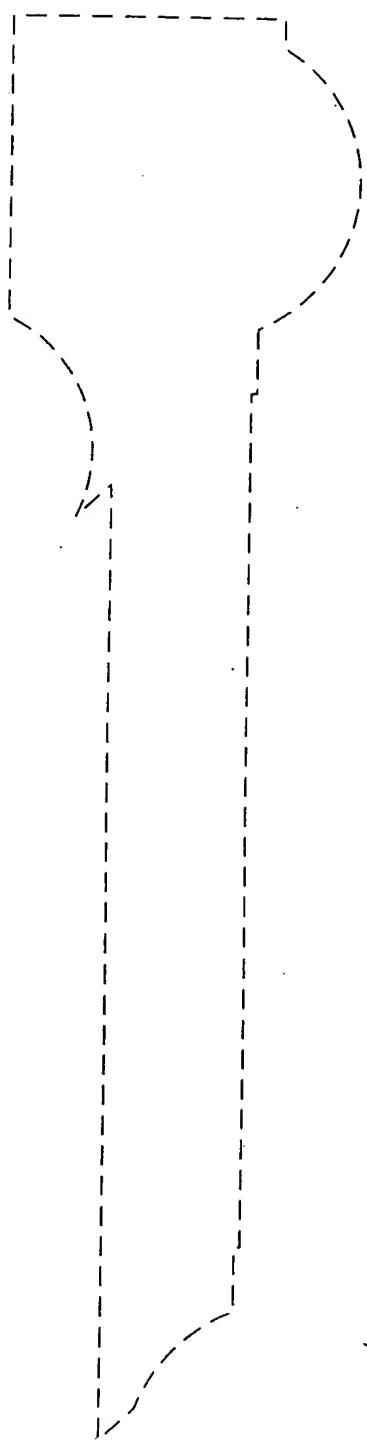
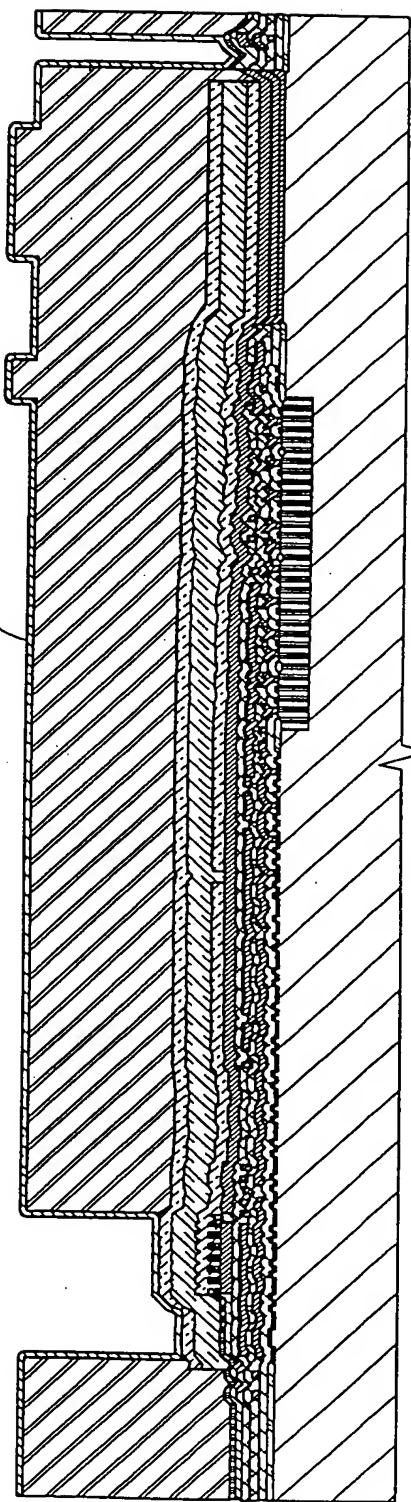


FIG. 64



257



Deposit chamber walls

FIG. 65

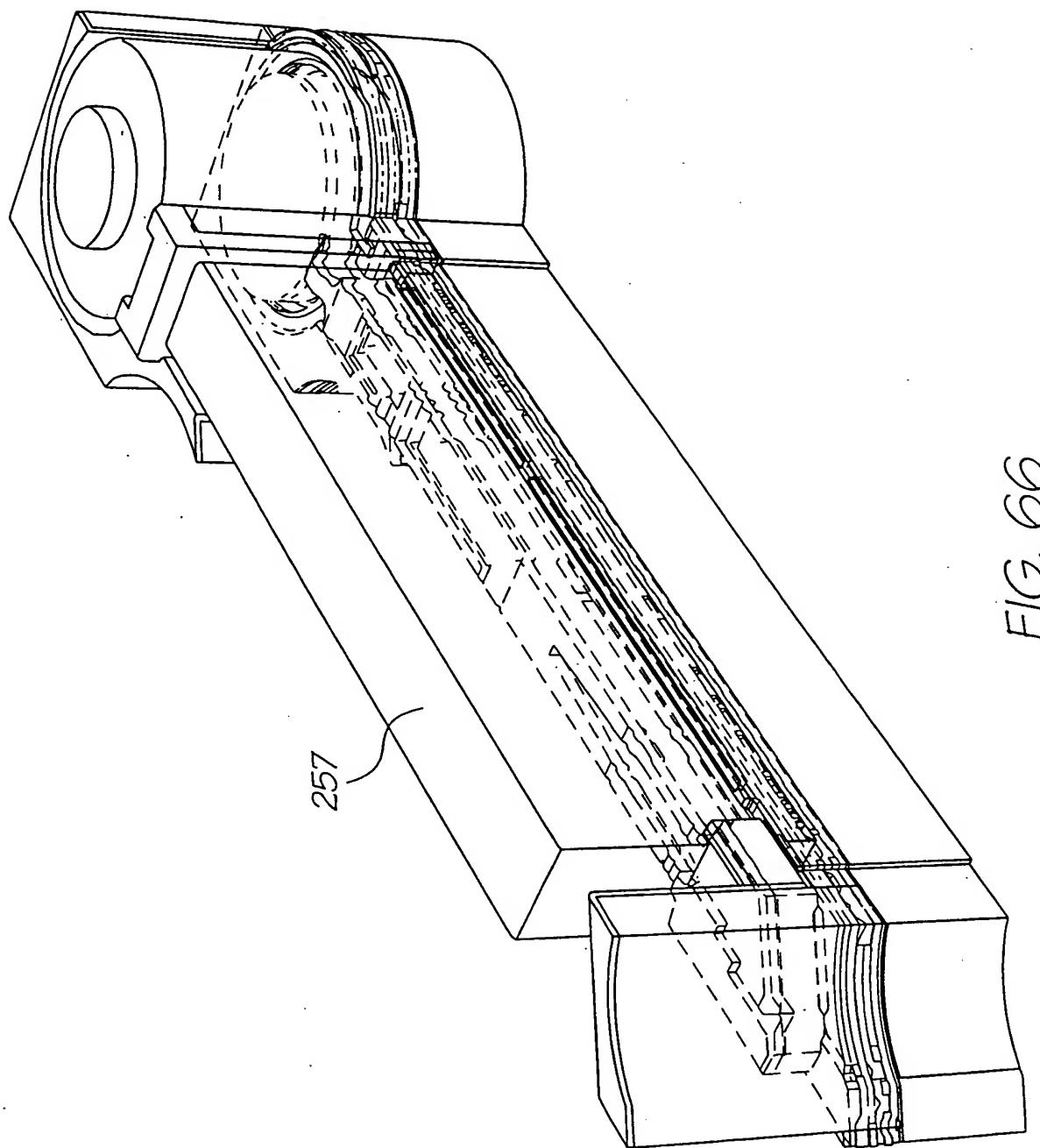


FIG. 66

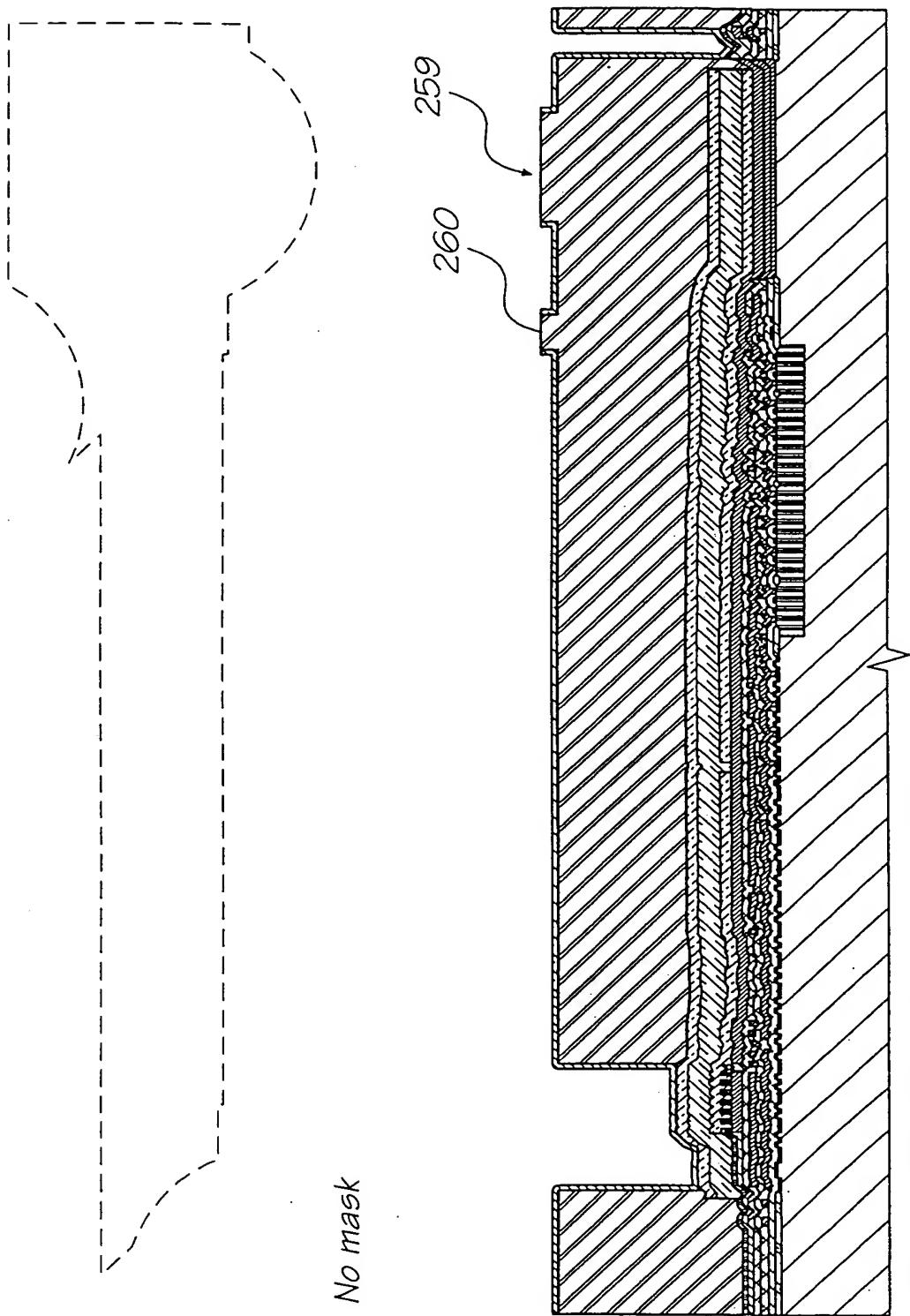


FIG. 67

Form self-aligned nozzles using CMP

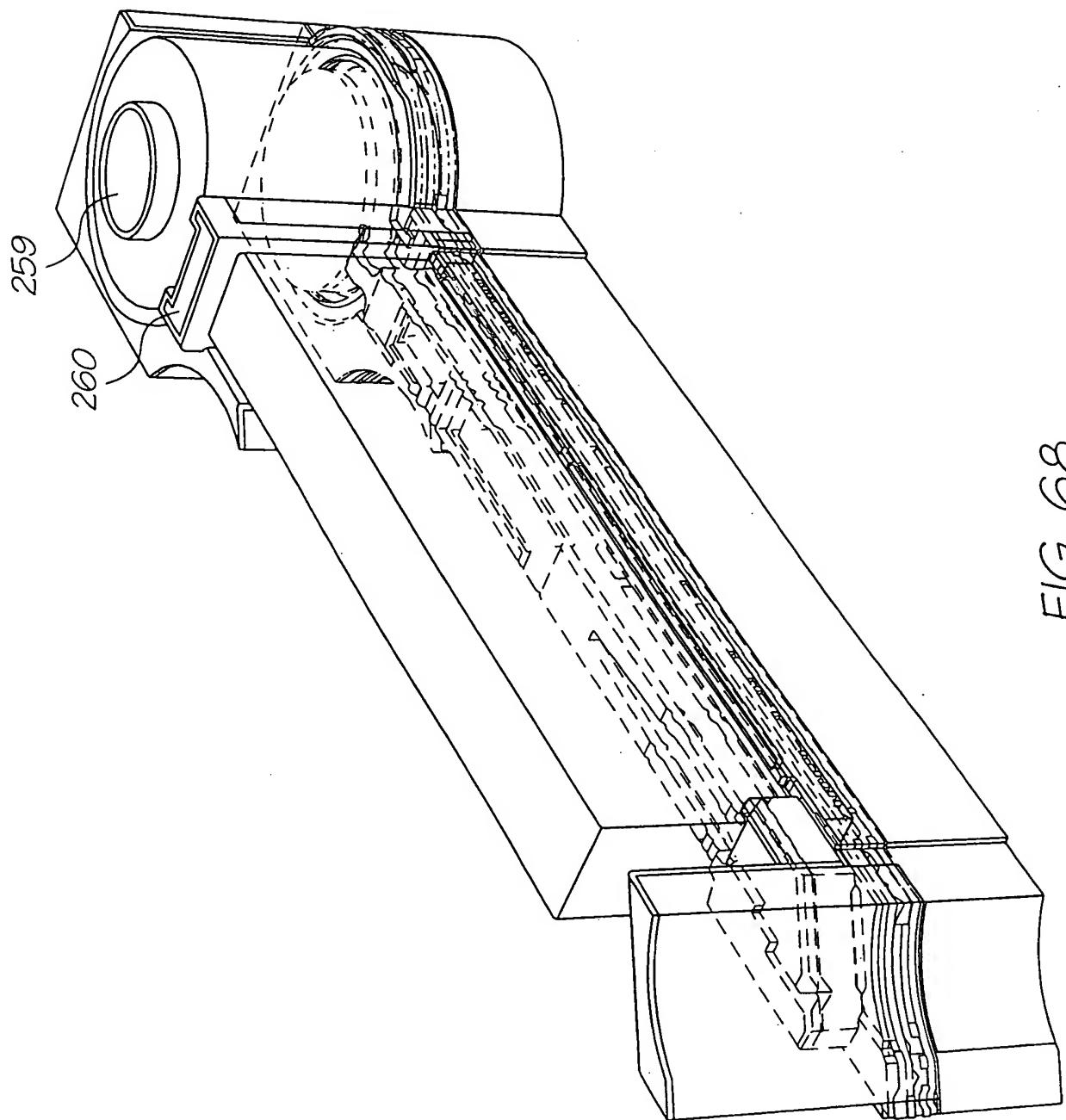
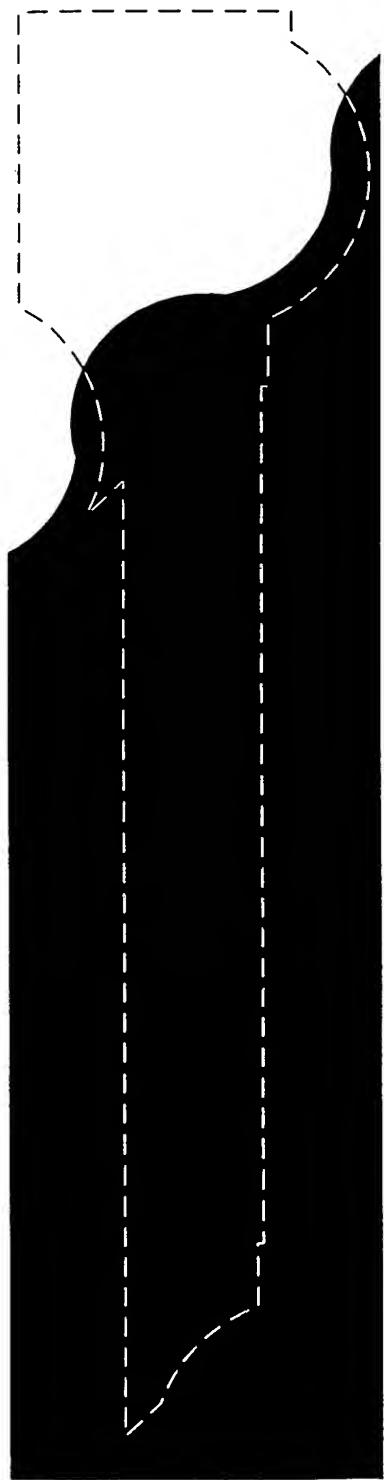
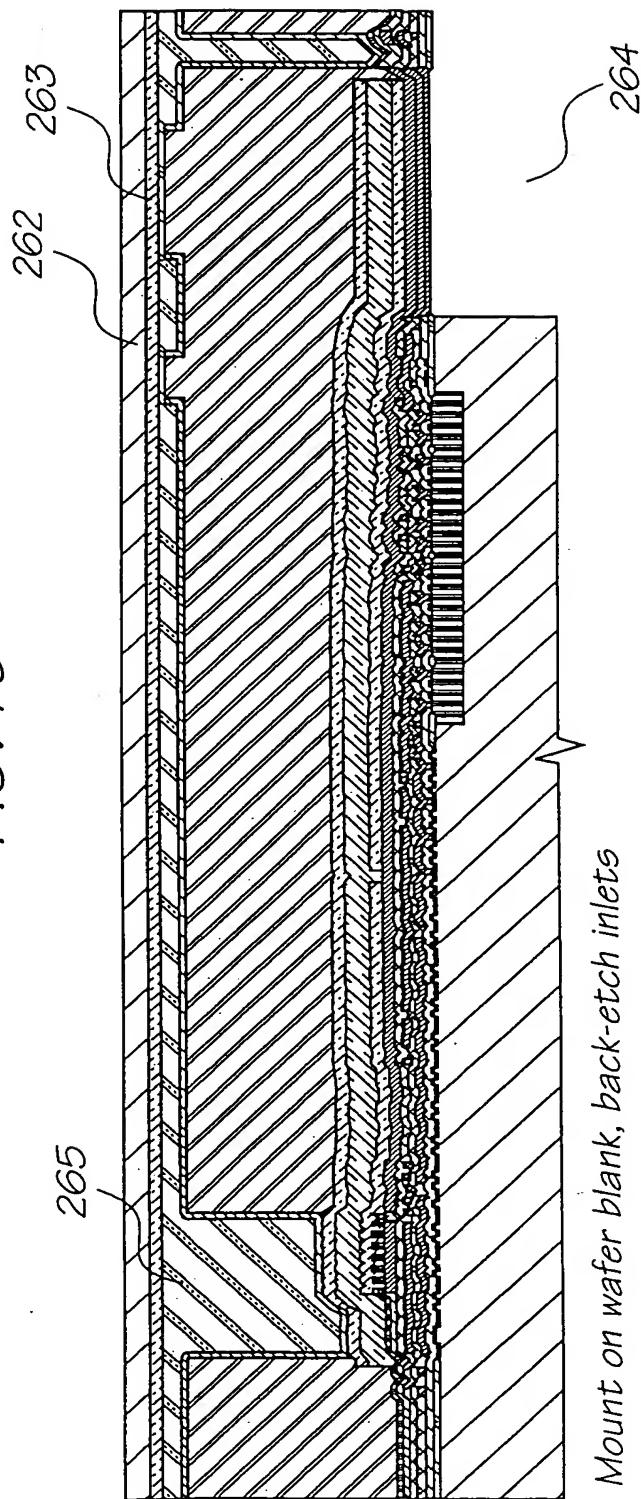


FIG. 68



Back-etch inlet mask

FIG. 70



Mount on wafer blank, back-etch inlets

FIG. 69

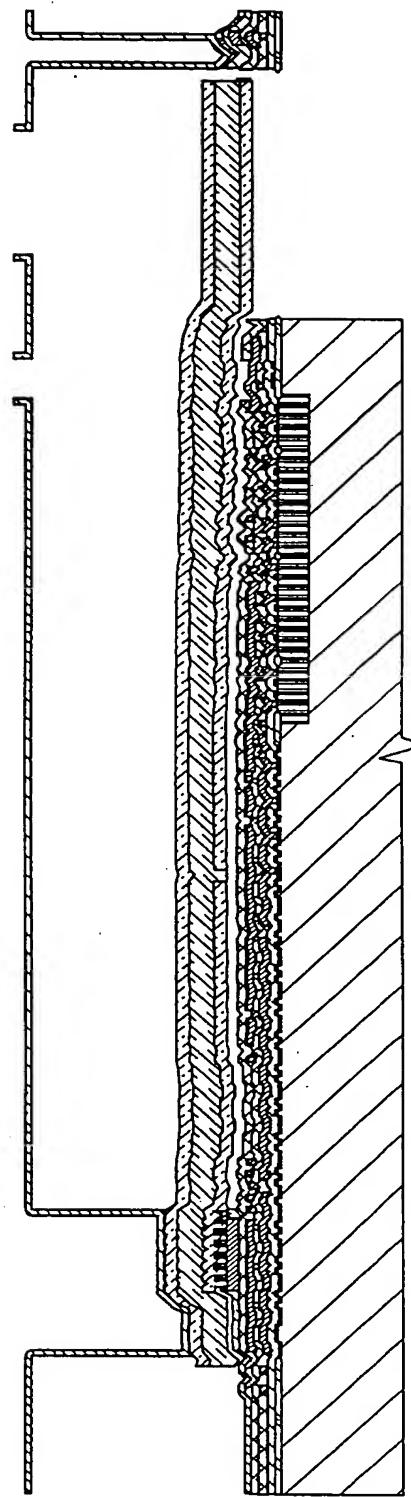
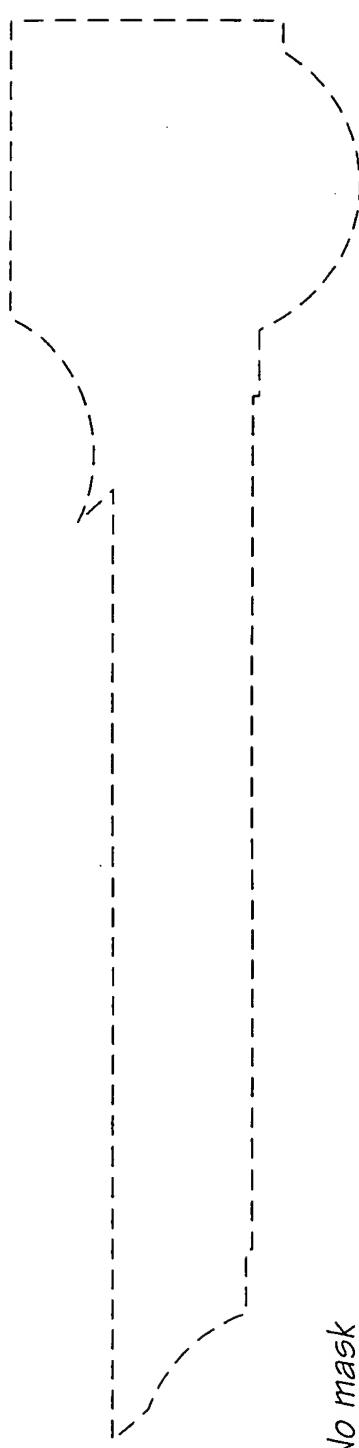


FIG. 71

Detach from wafer blank, etch sacrificial material

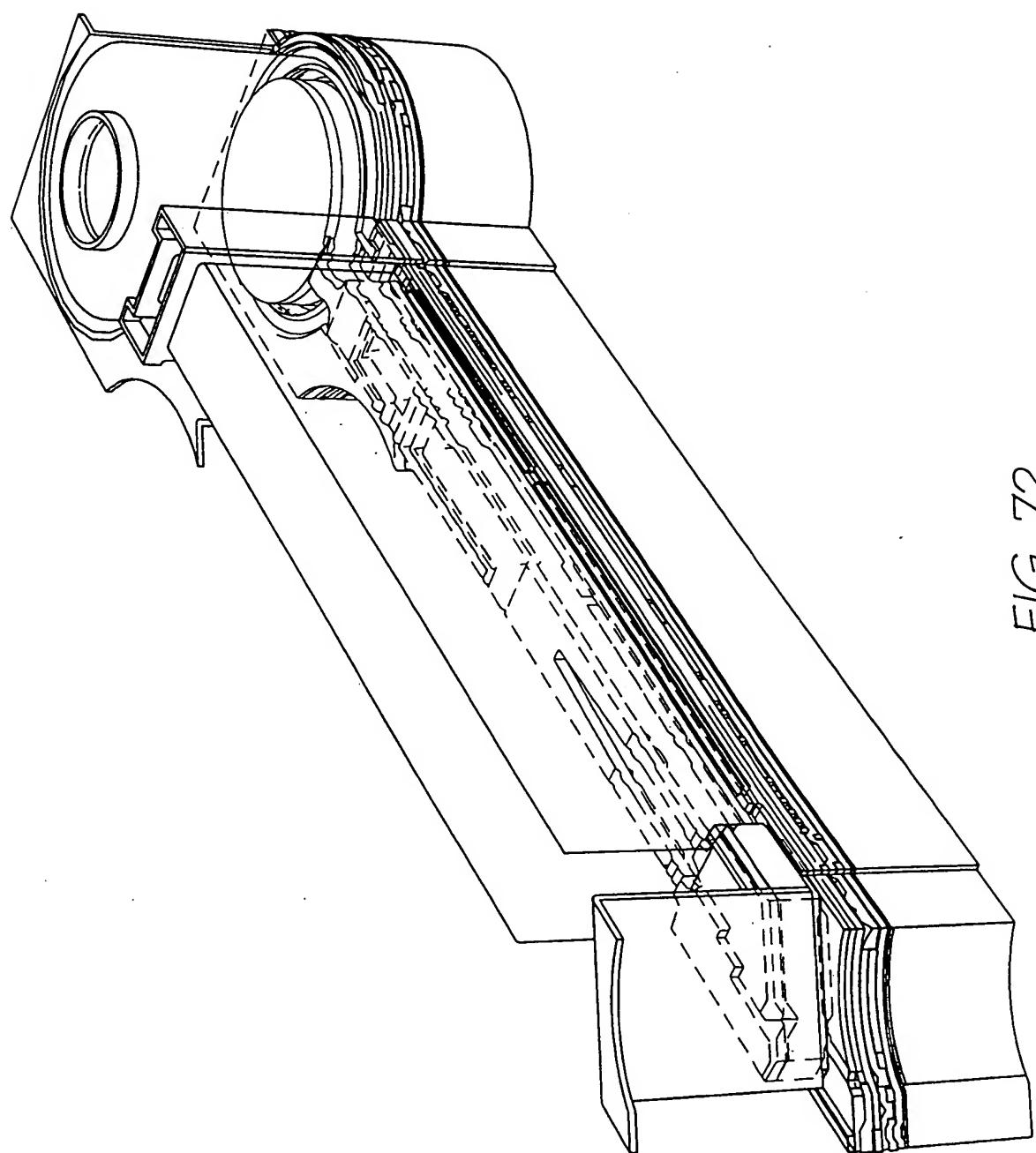


FIG. 72

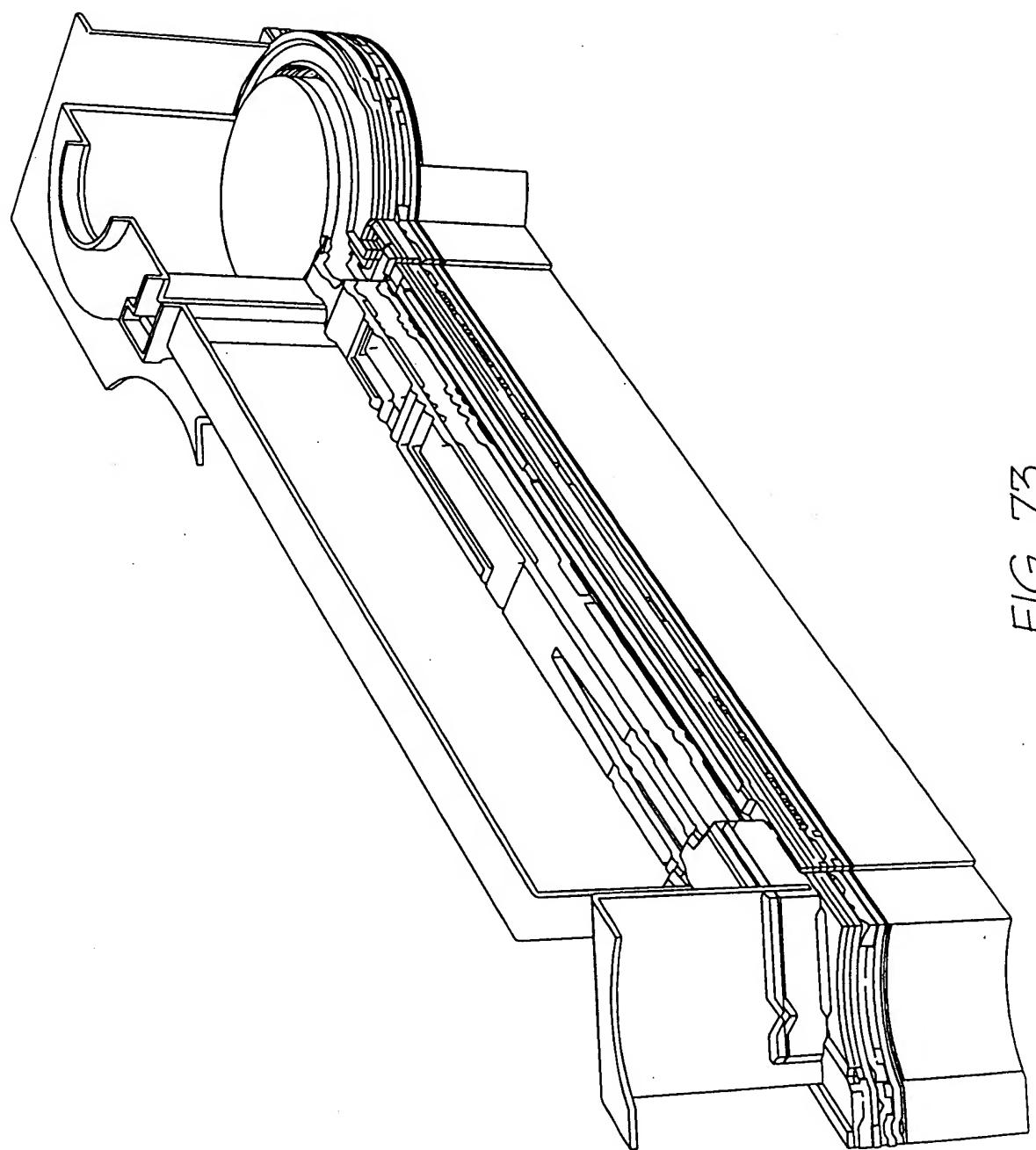


FIG. 73

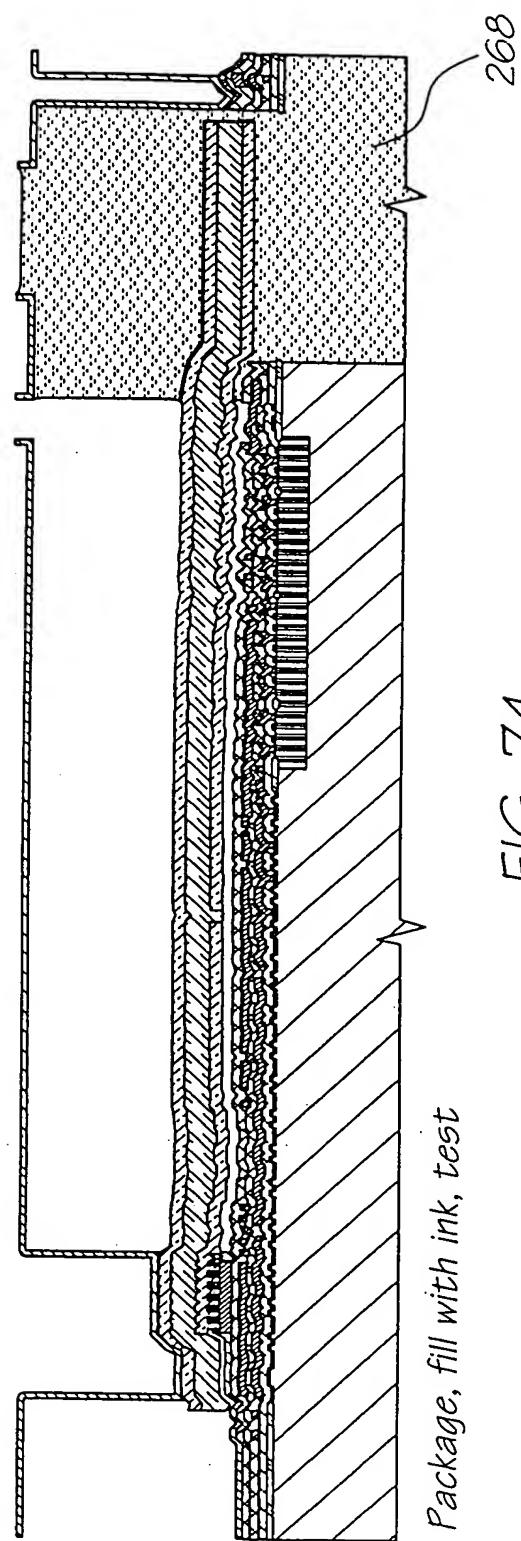
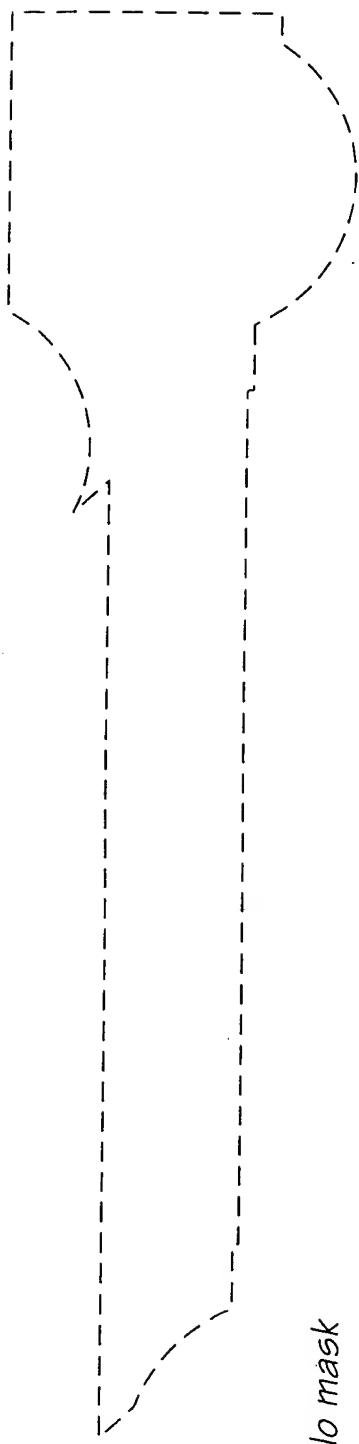


FIG. 74

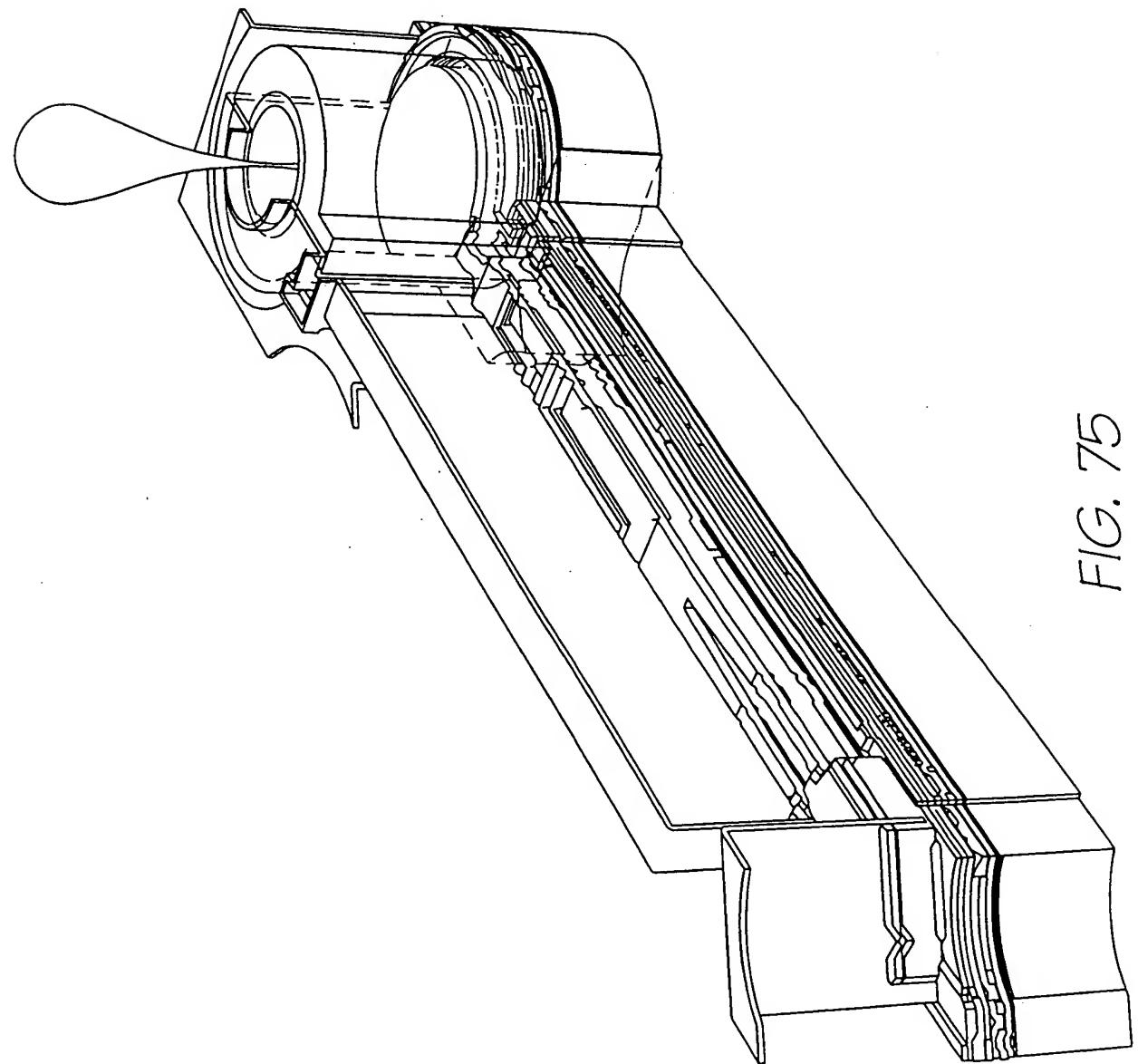


FIG. 75

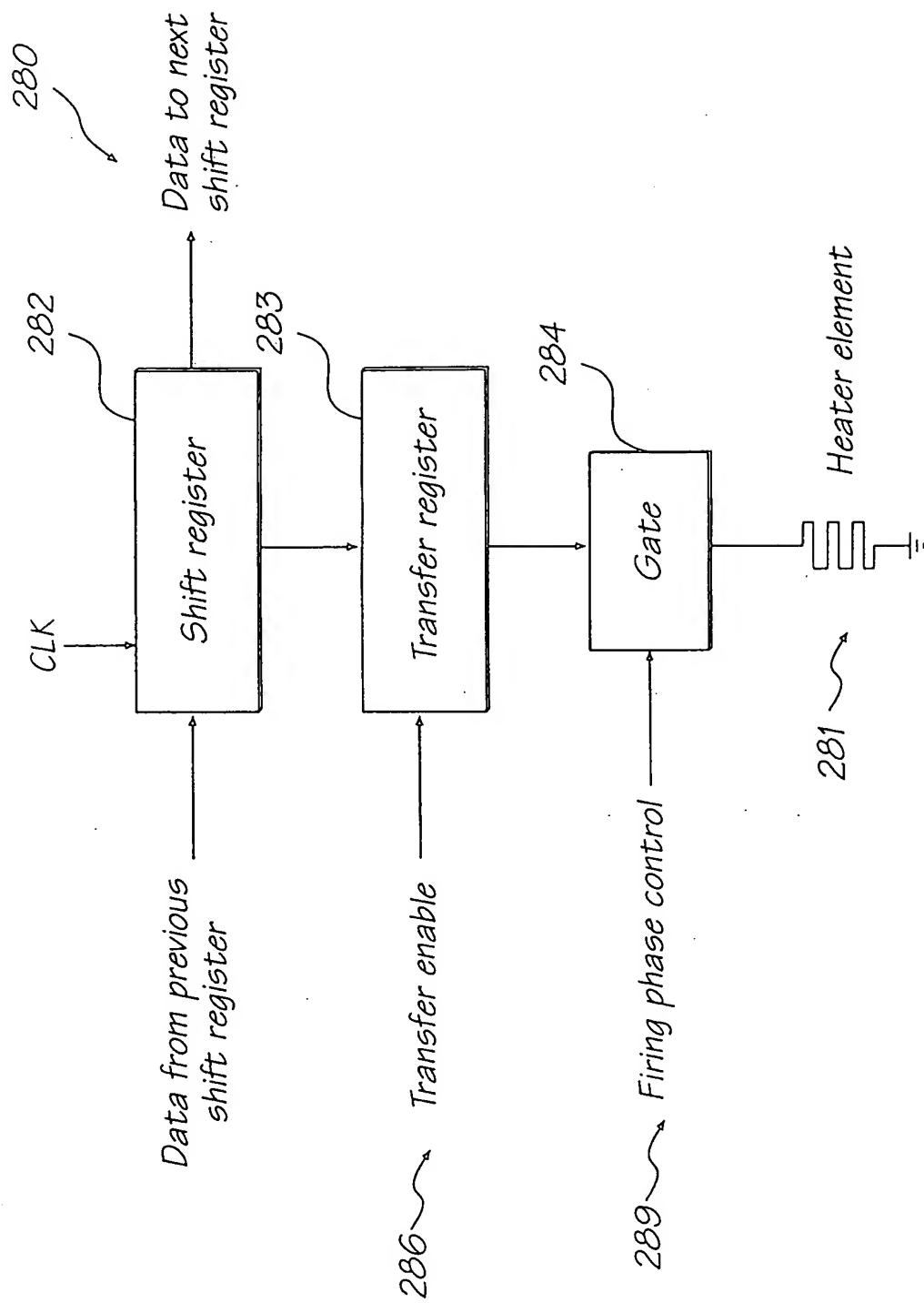


FIG. 76

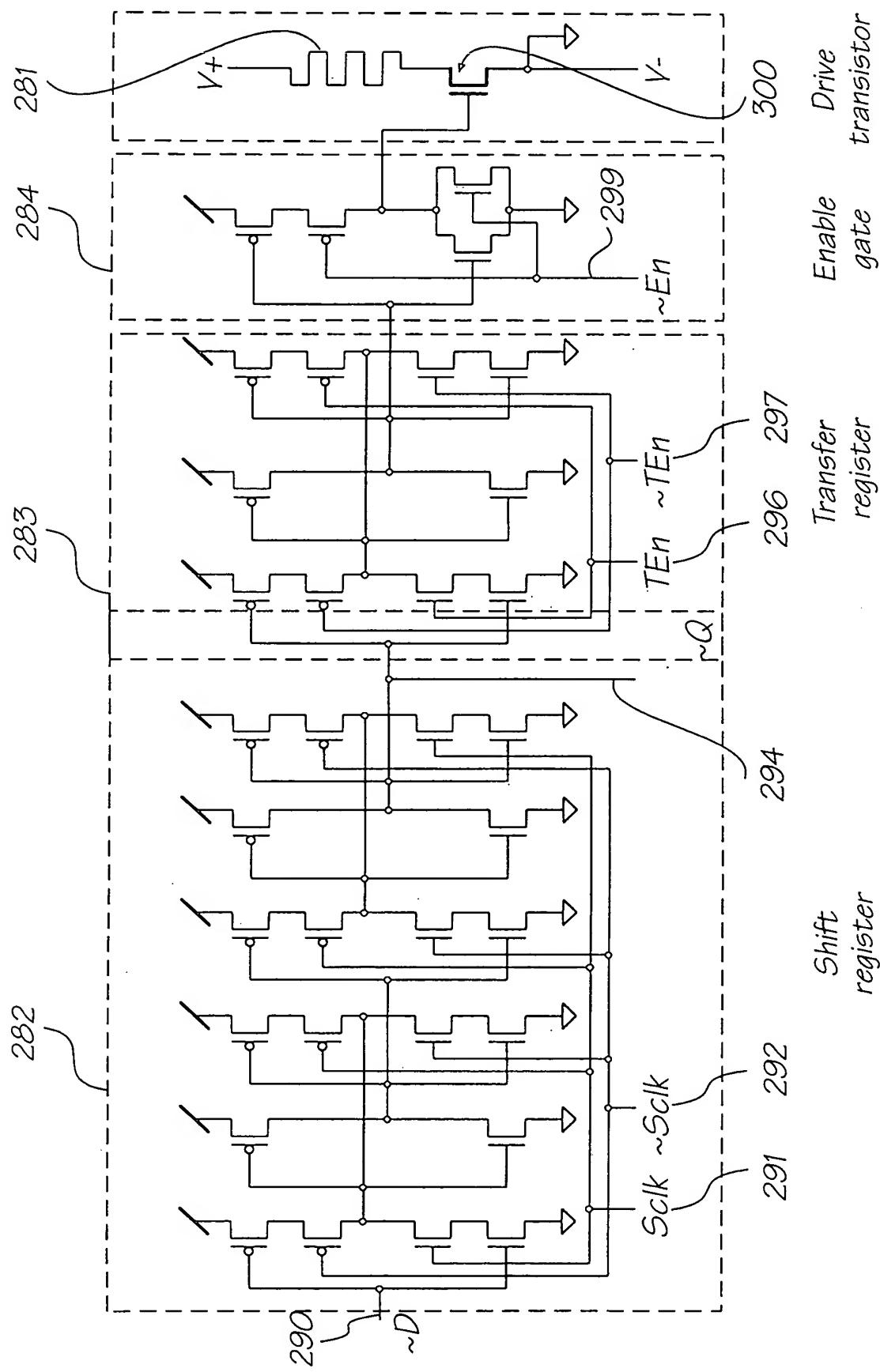


FIG. 77

Key

	Silicon		Poly		Via 2		Actuator TiN		Cyan Ink
			Contacts		Metal 3		Actuator Glass		Magenta Ink
	Active		Metal 1		Via 3		Compensator TiN		Yellow Ink
	p+				Via 1				Sacrificial
	n+				Metal 2				Sacrificial-nozzle
									Shroud
									Root
									Wall
									Rim
									Floor

FIG. 78

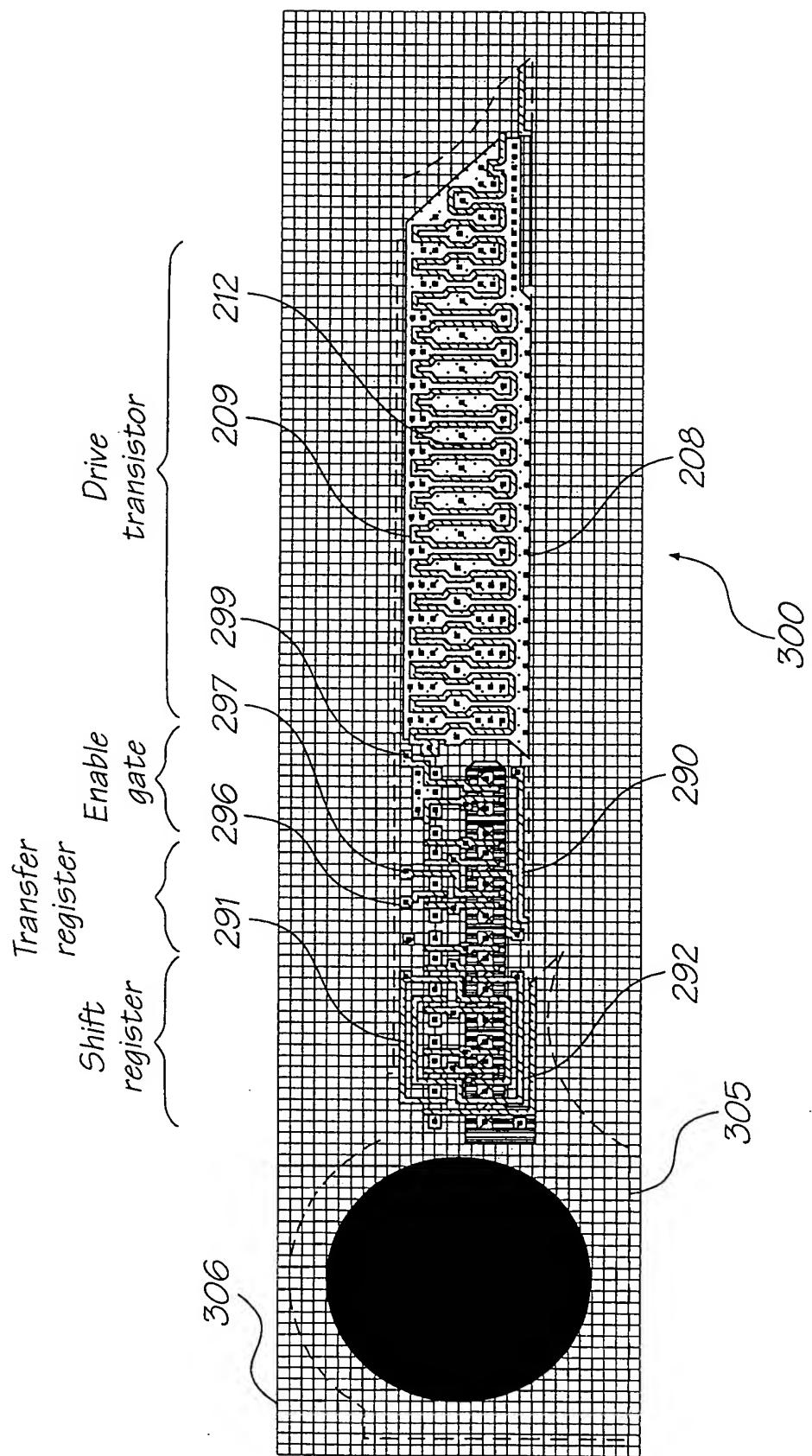


FIG. 79

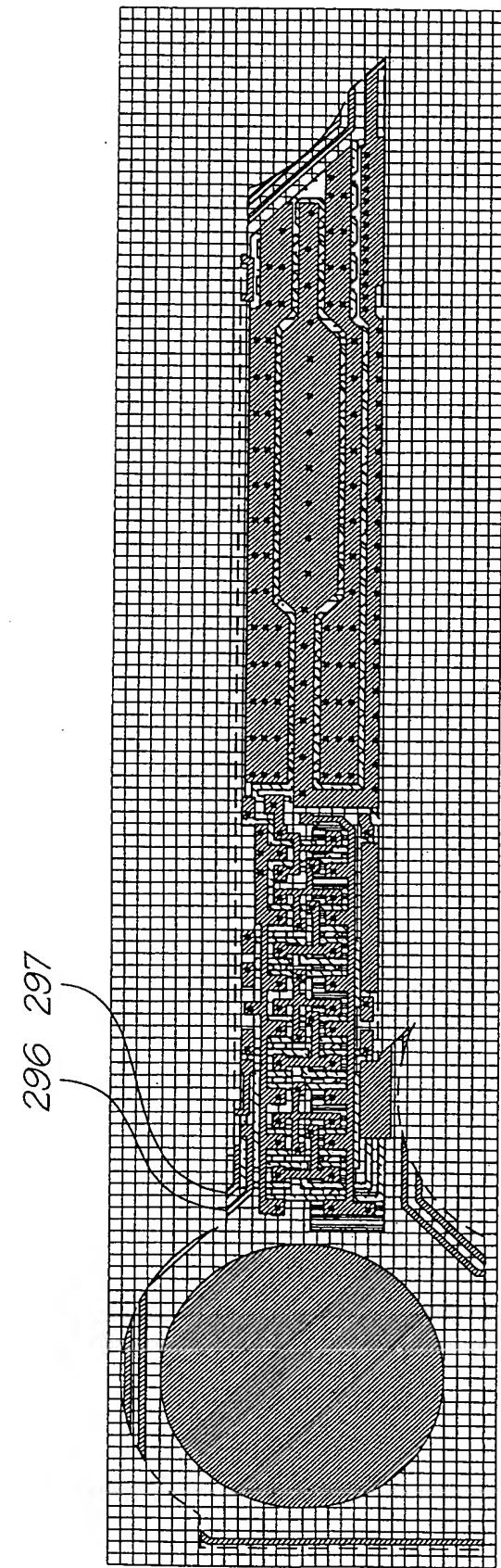


FIG. 80

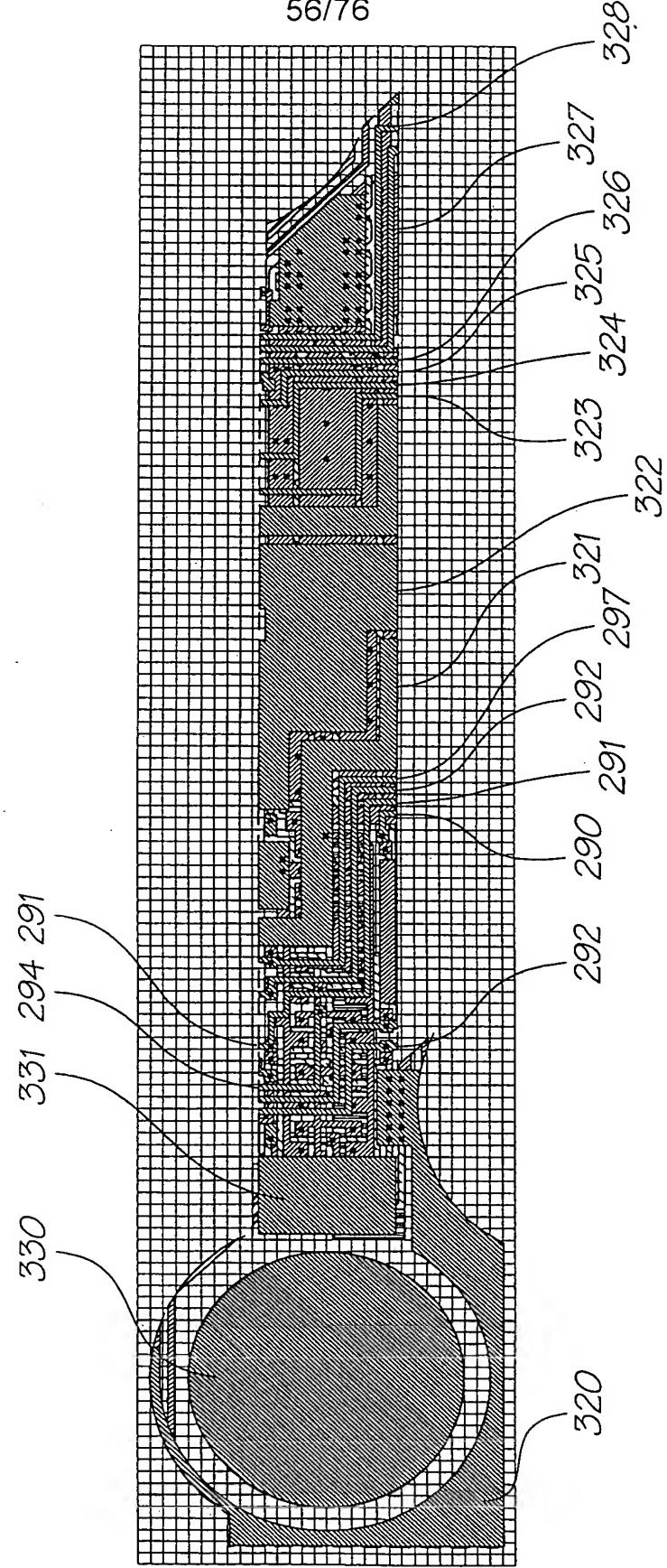


FIG. 81

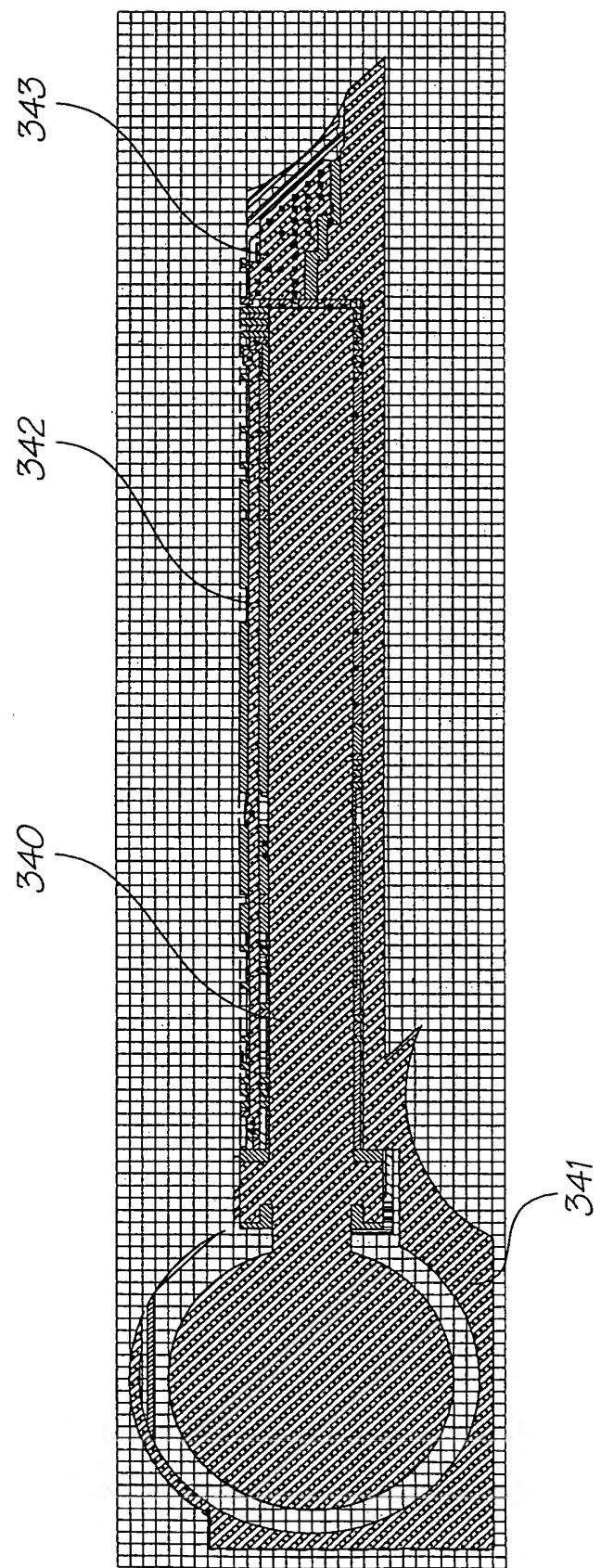


FIG. 82

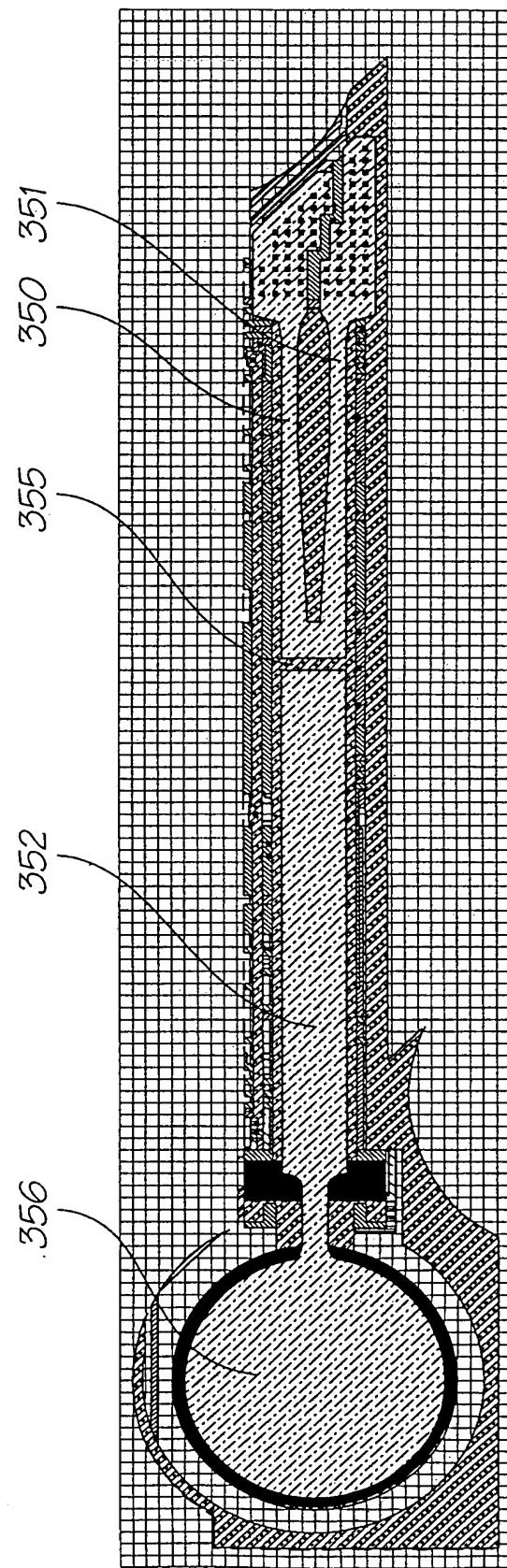


FIG. 83

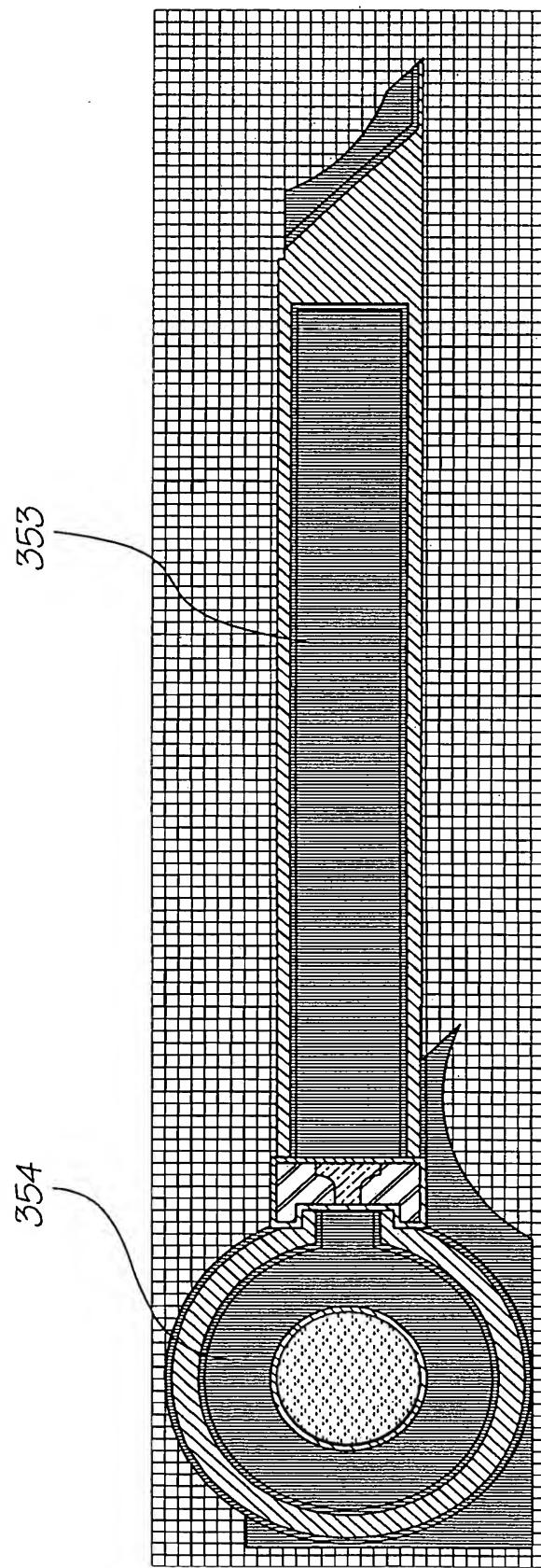


FIG. 84

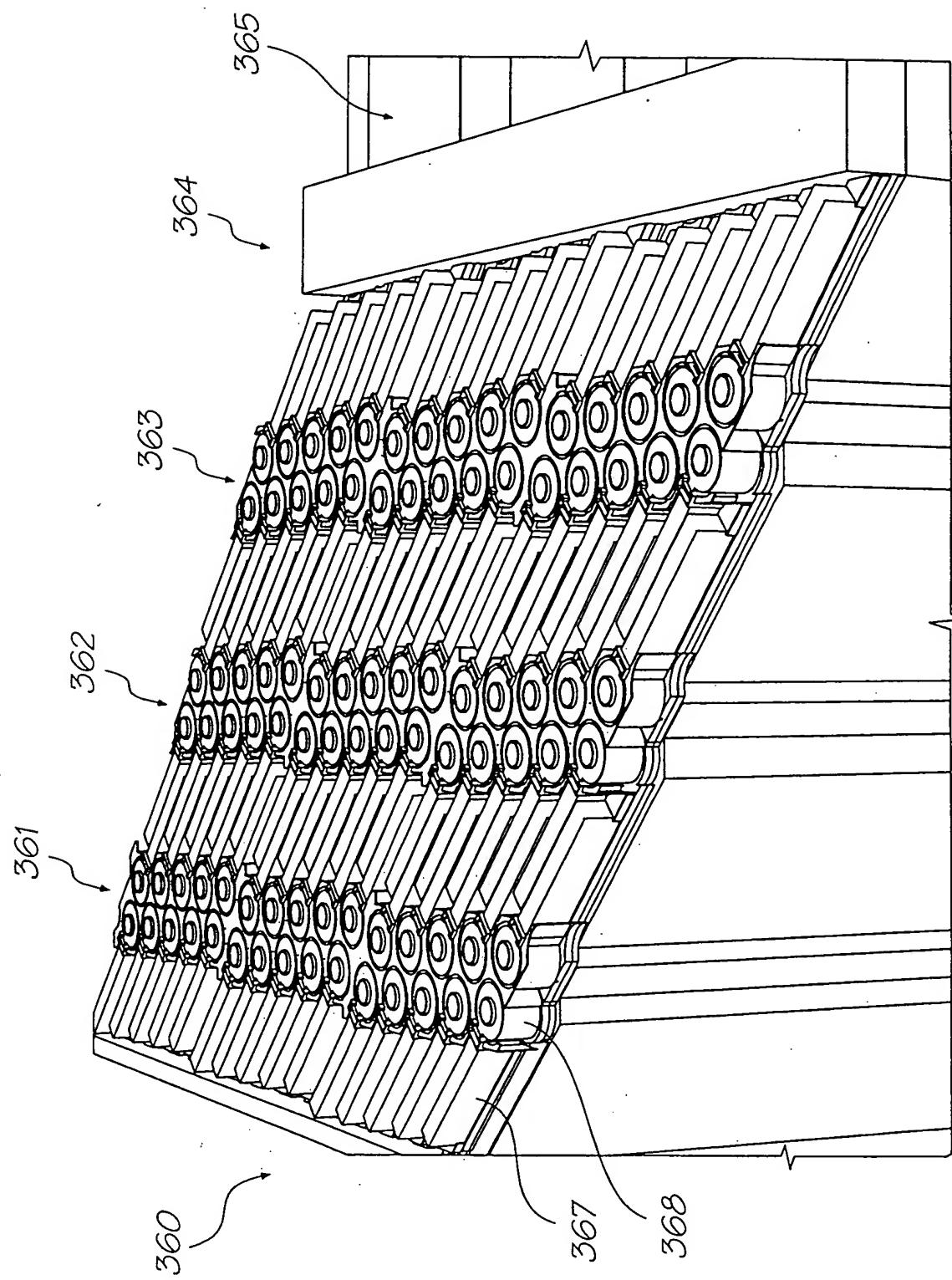
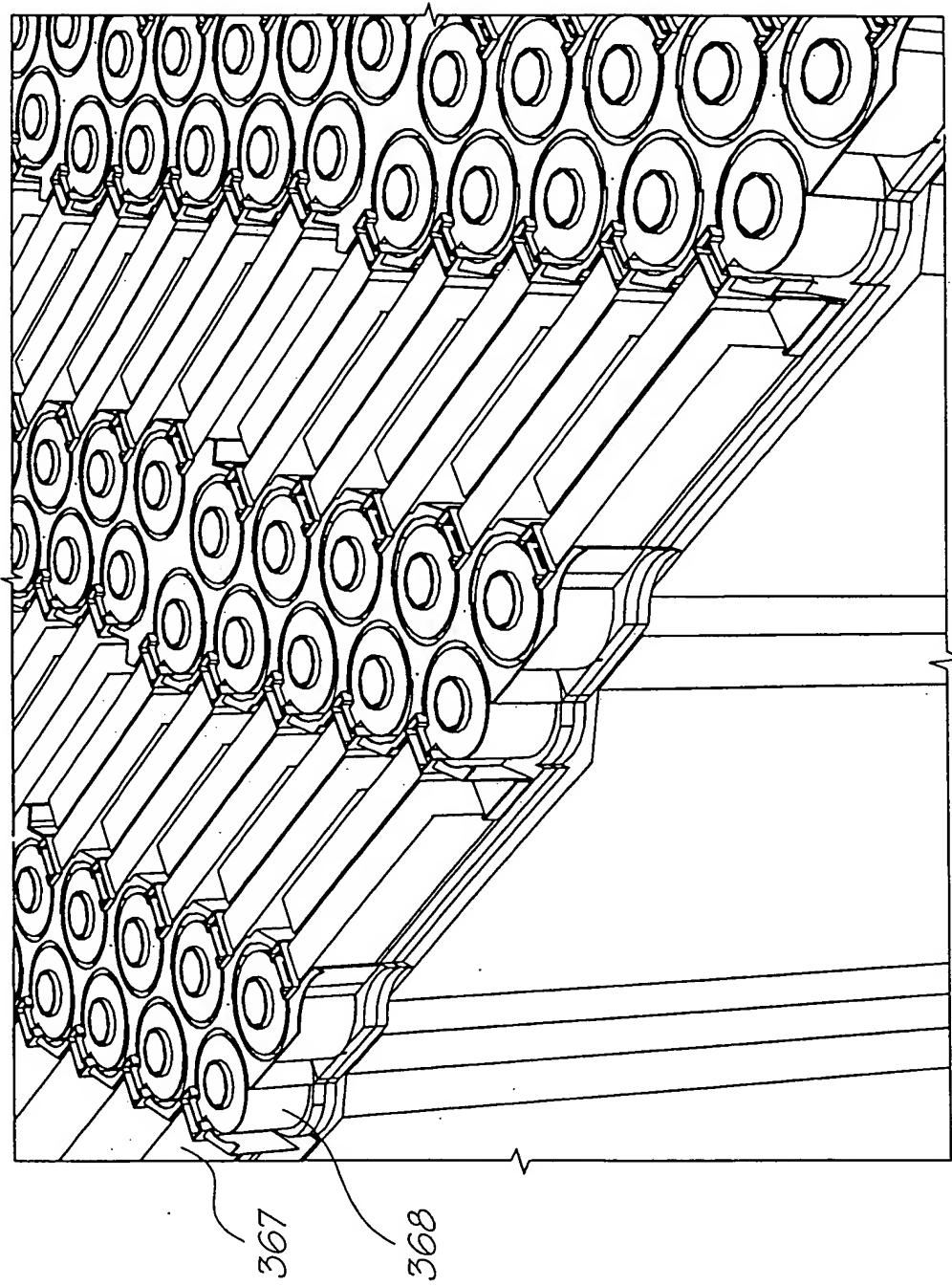


FIG. 85

FIG. 86



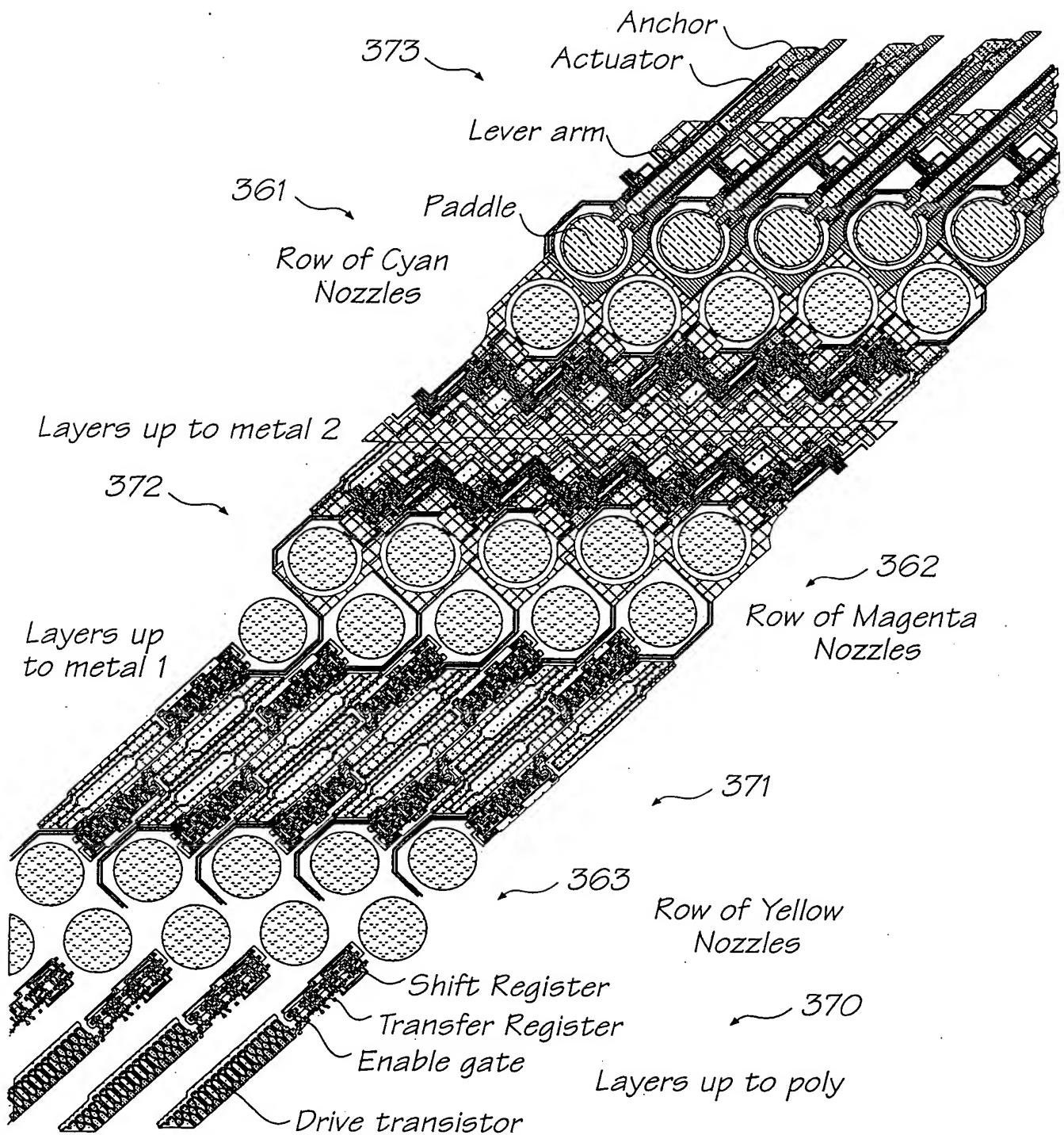


FIG. 87

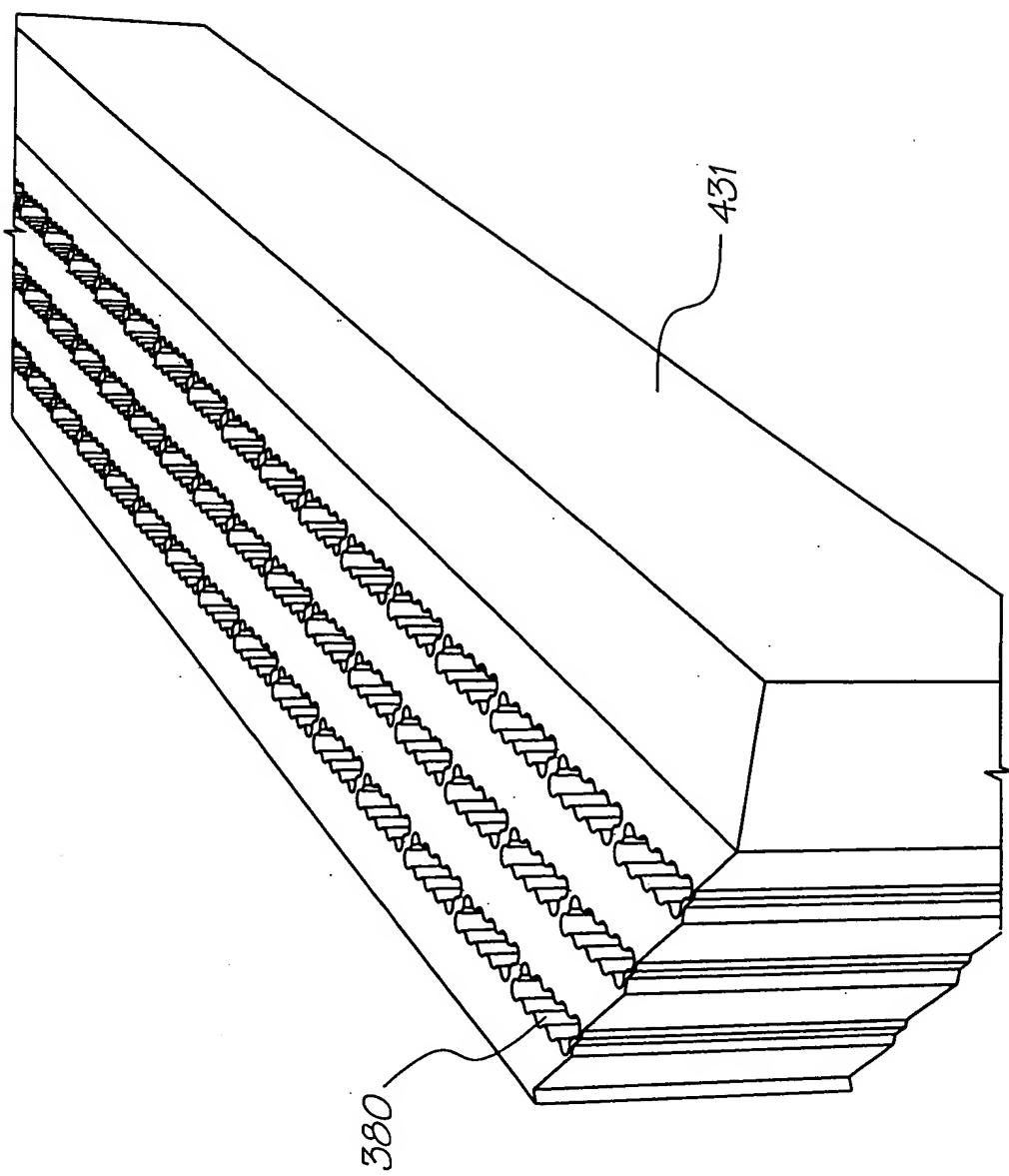


FIG. 88

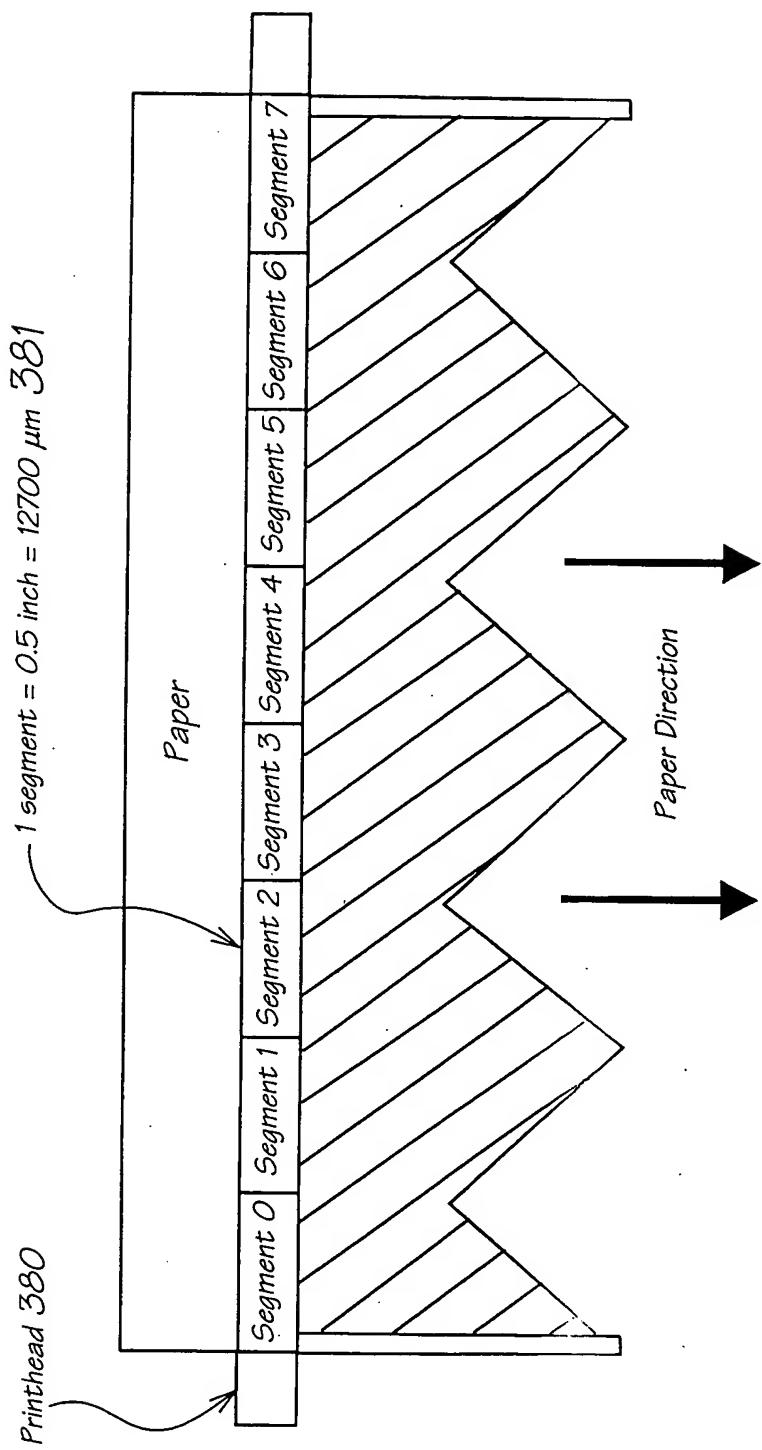
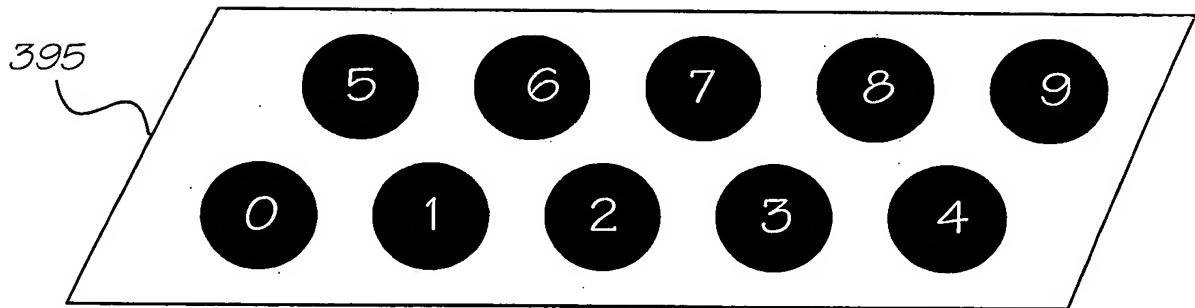


FIG. 8.9



A single pod, numbered by firing order

Fig. 90

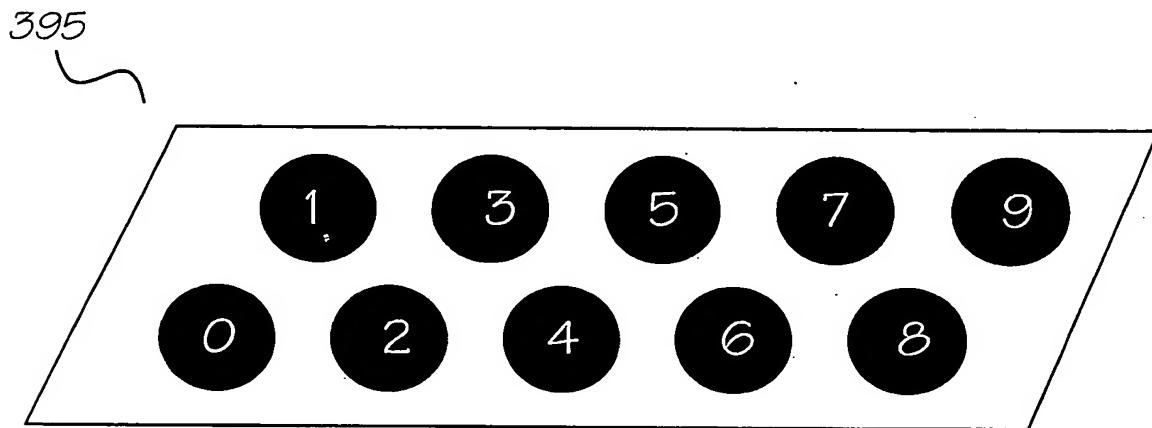


Fig. 91

10 tripods

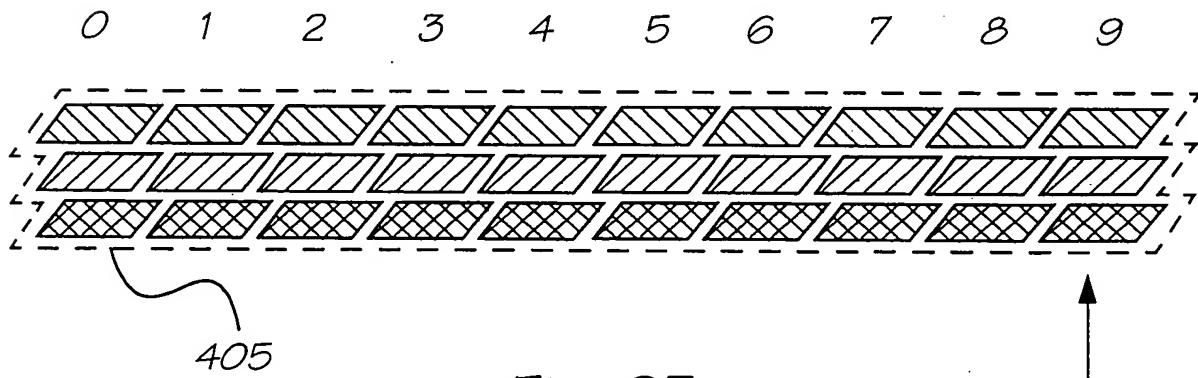


Fig. 93

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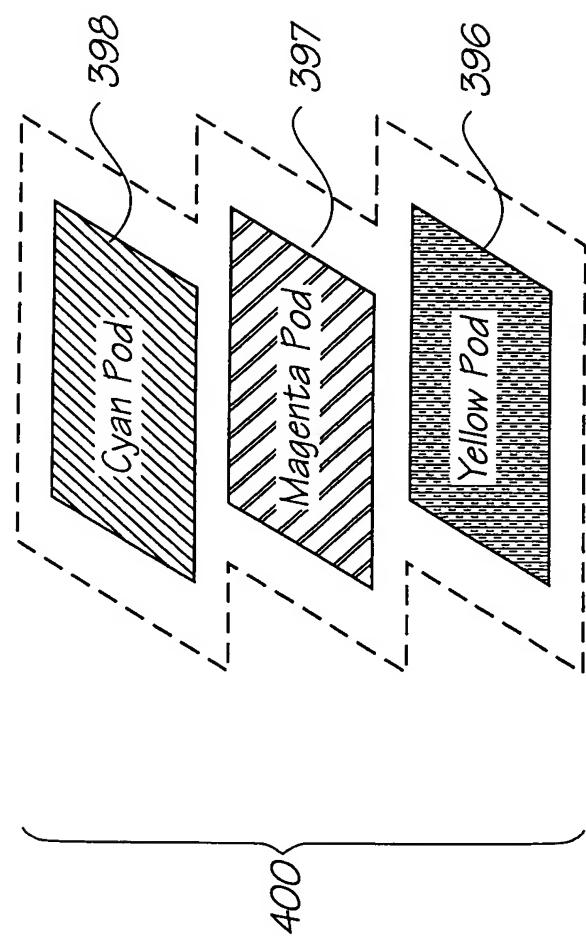


FIG. 92

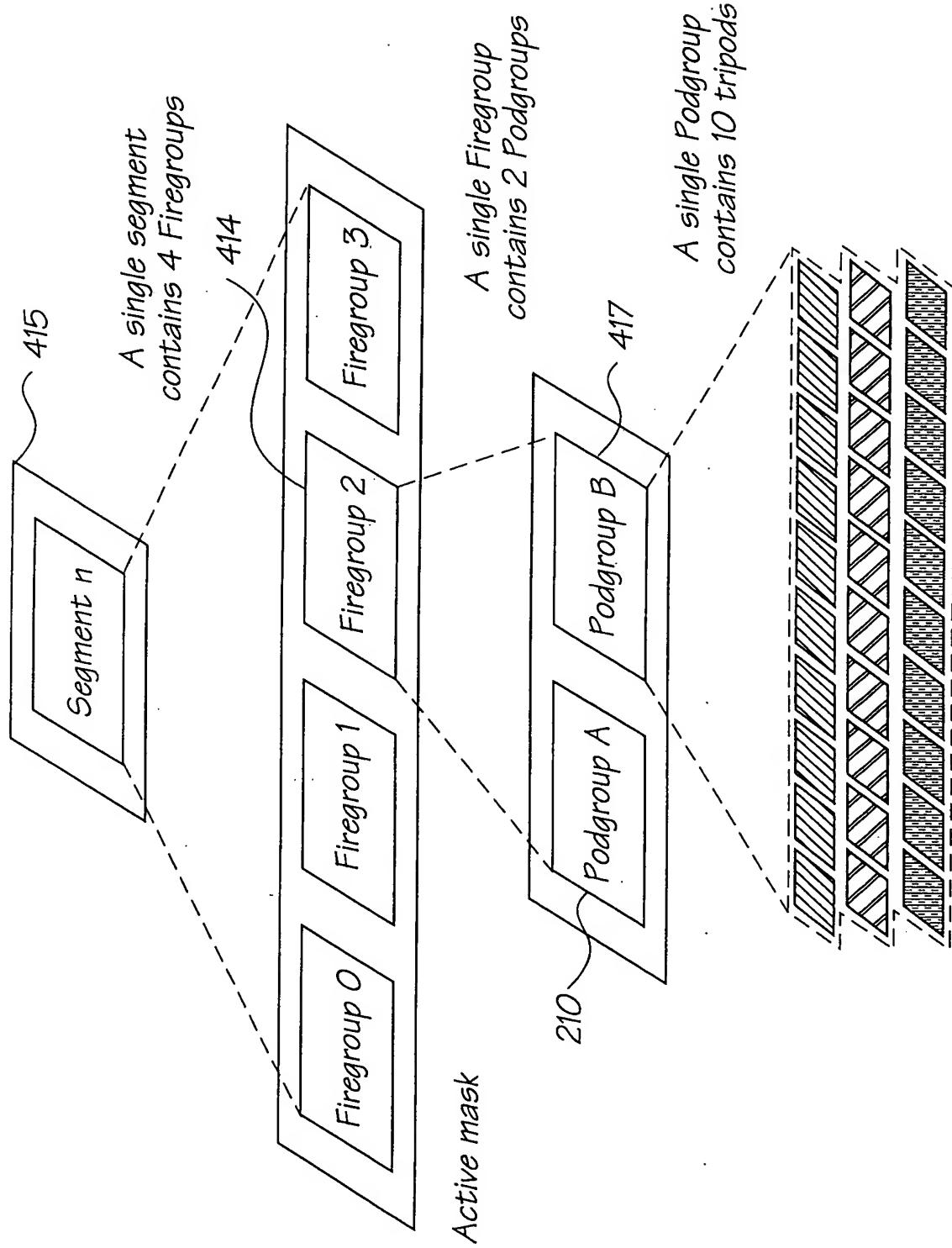
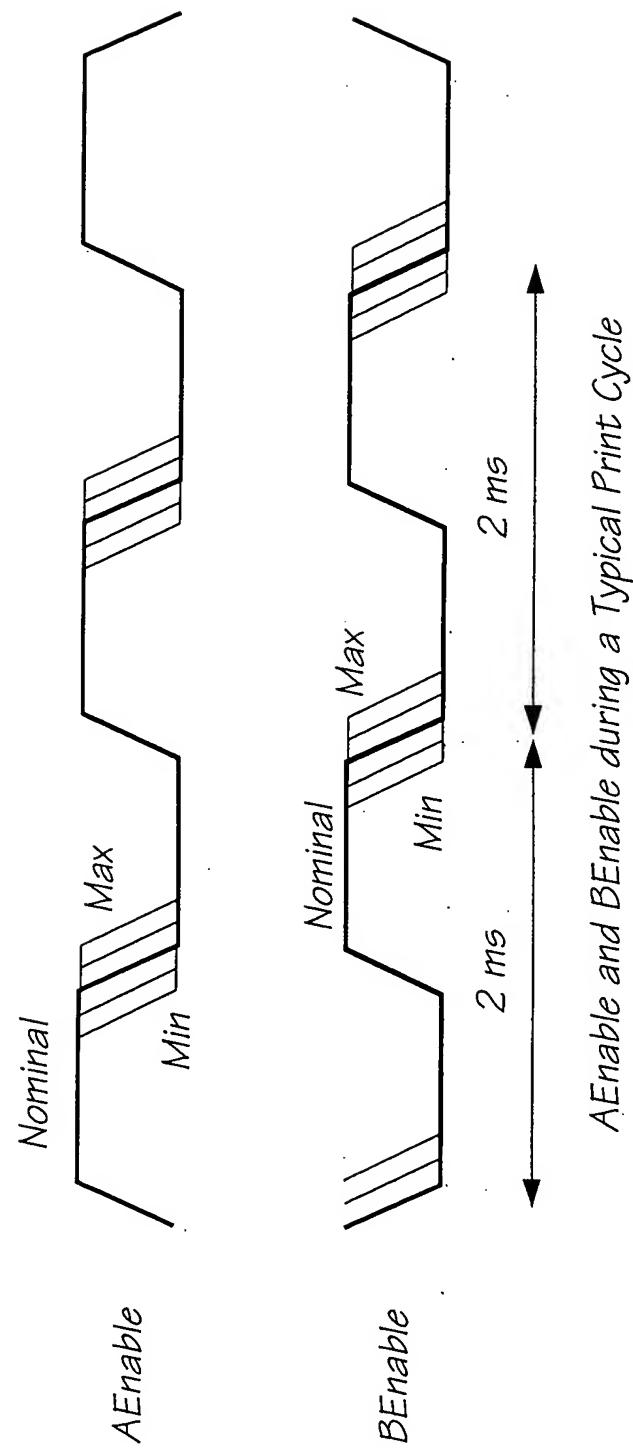


FIG. 94



AEnable and BEnable during a Typical Print Cycle

Fig. 95

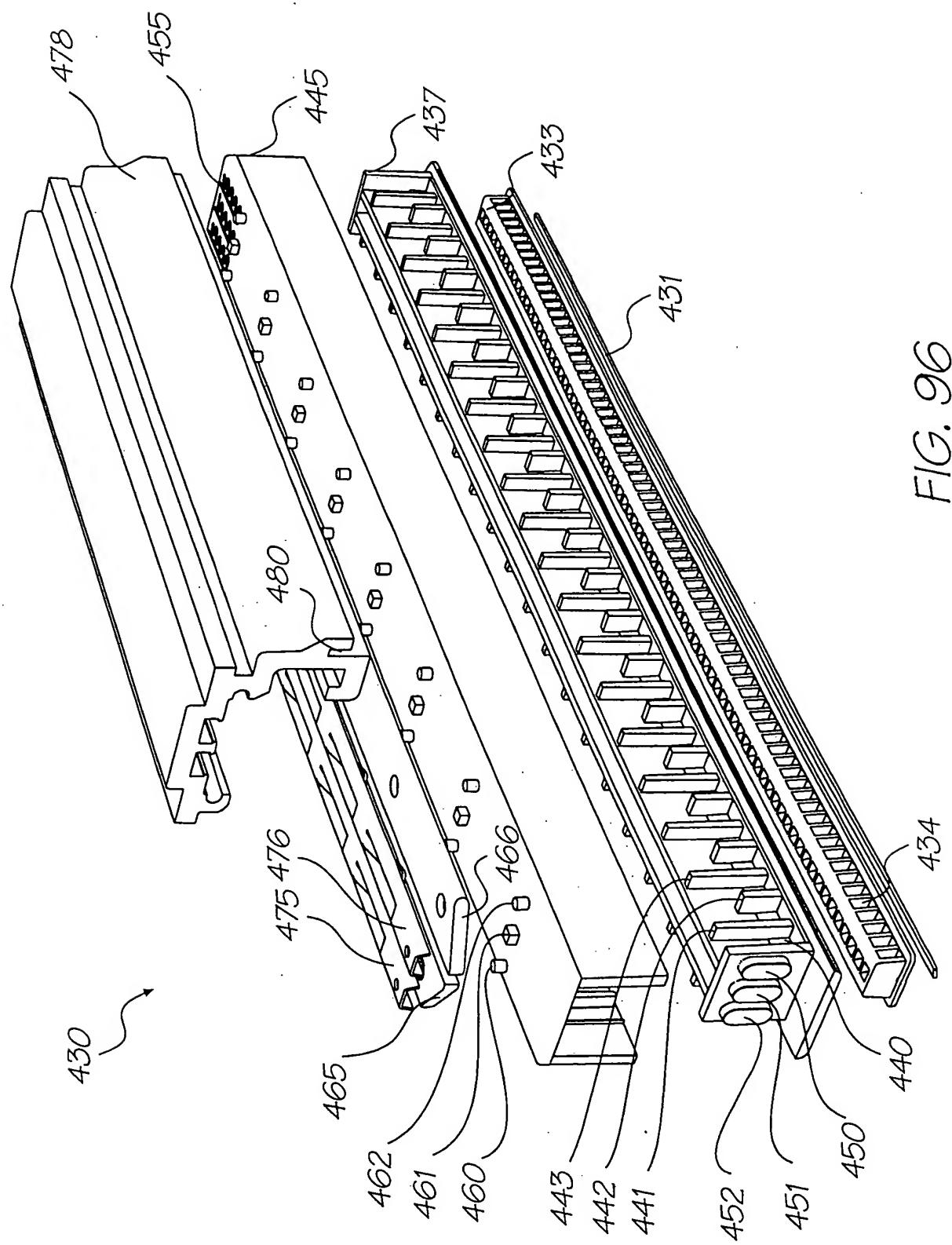


FIG. 96

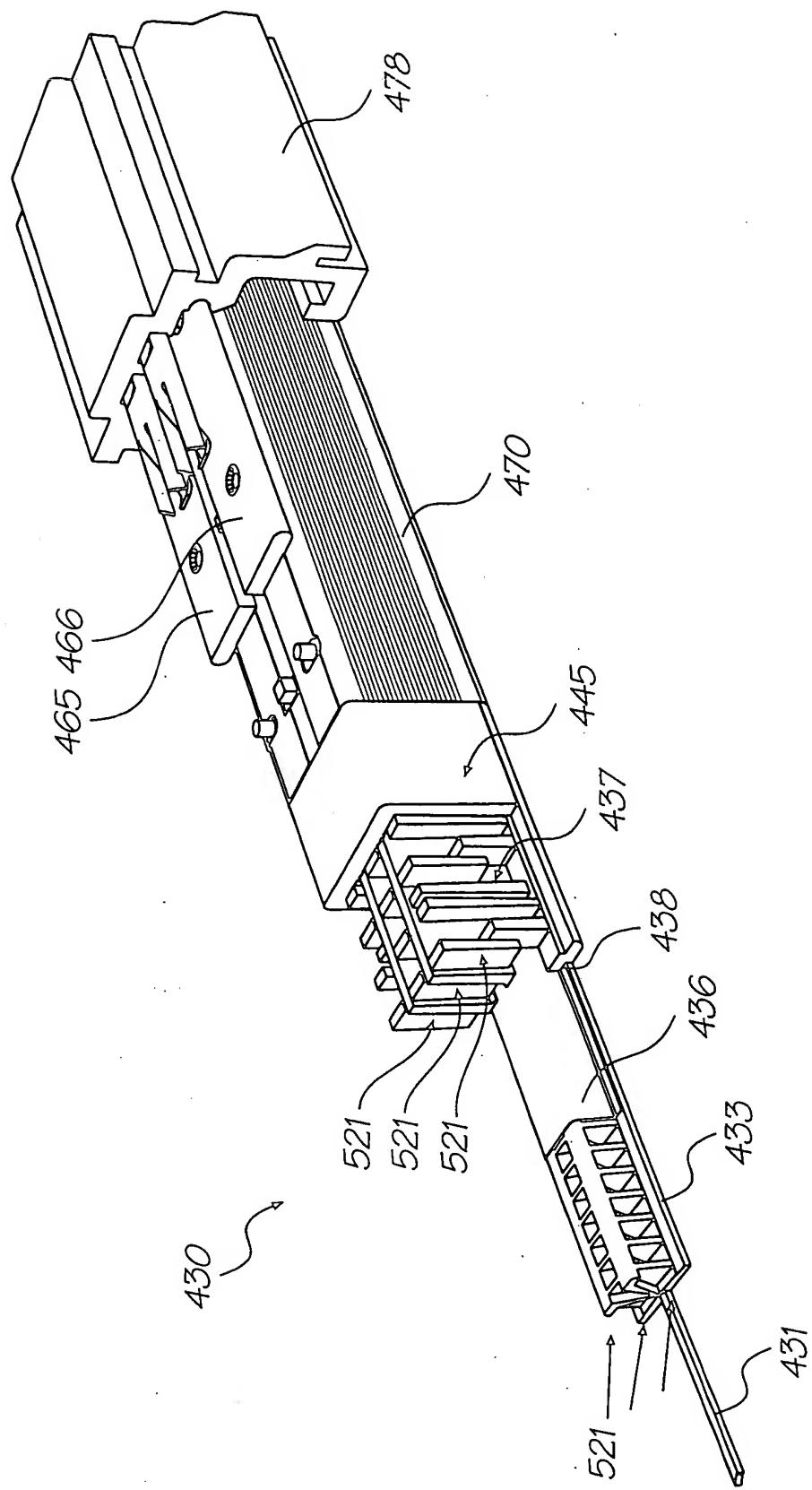
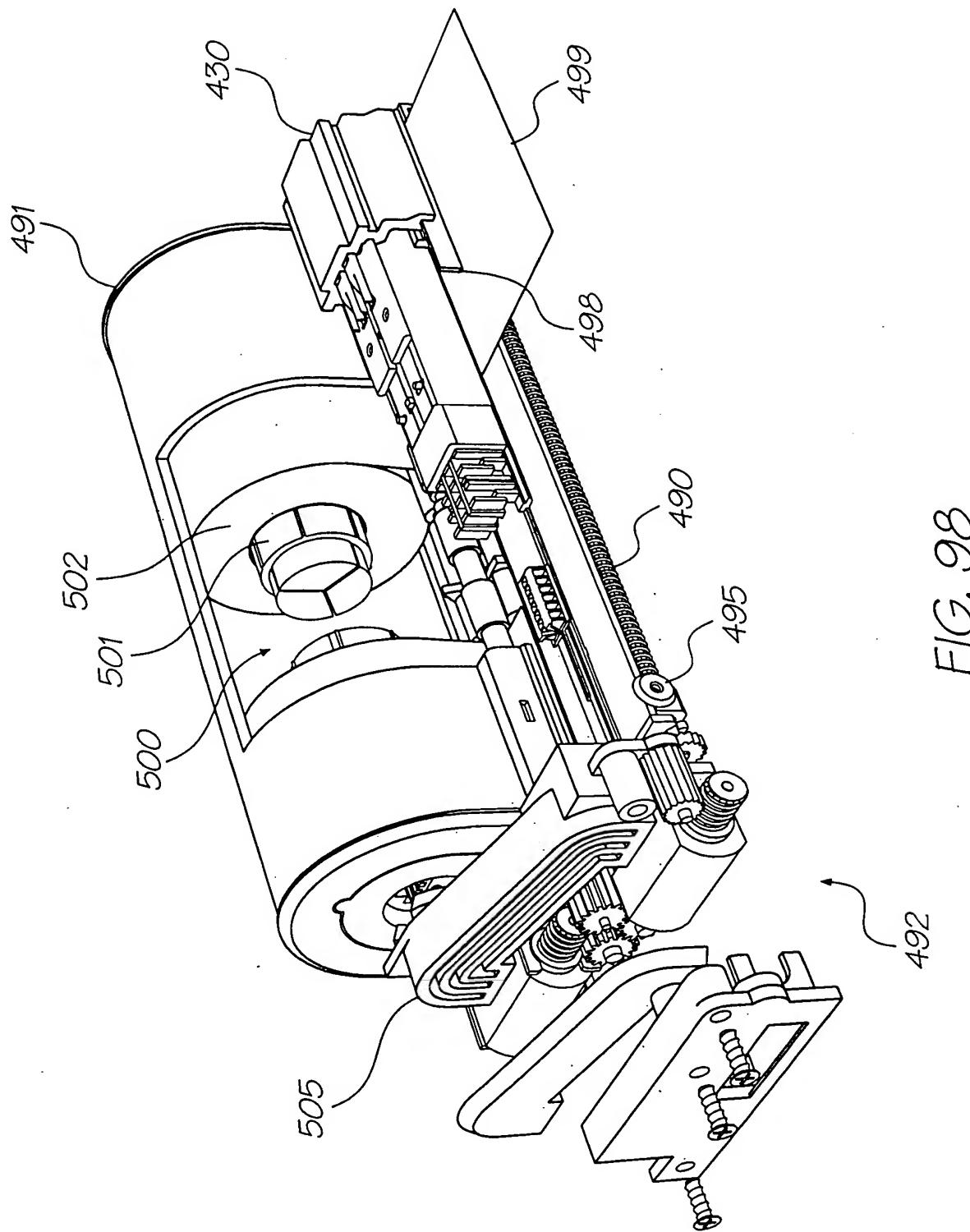


FIG. 97



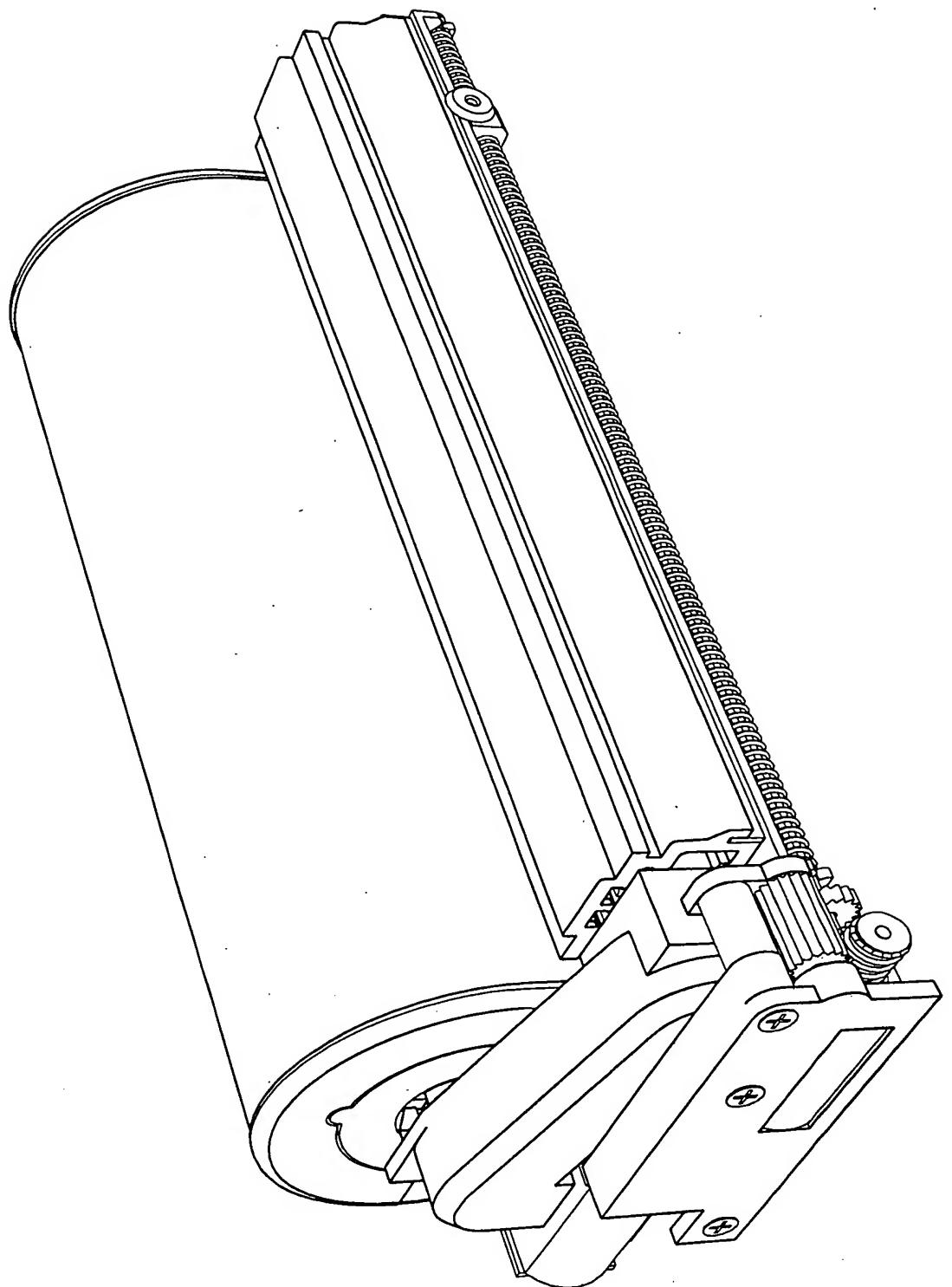


FIG. 99

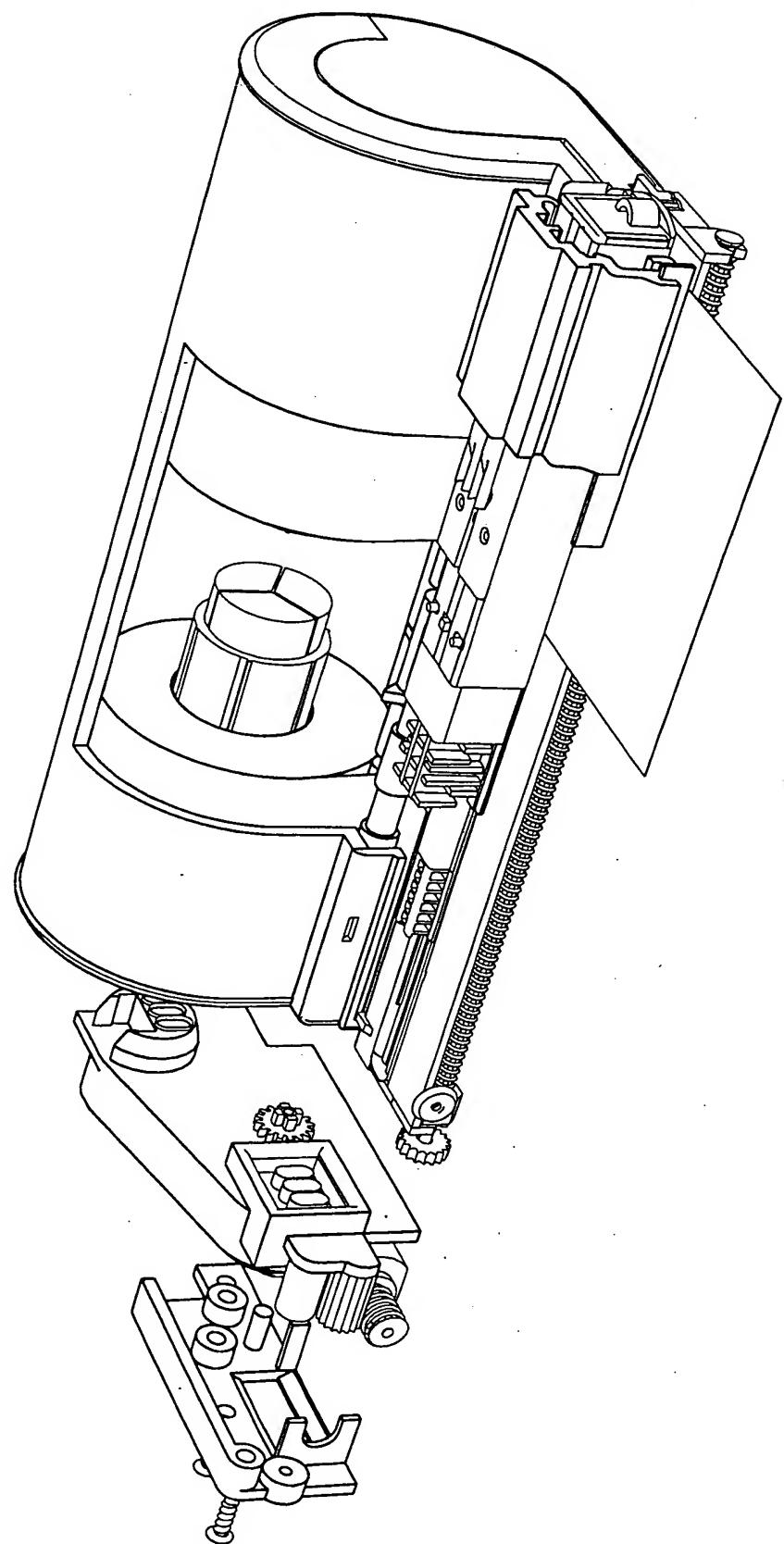


FIG. 100

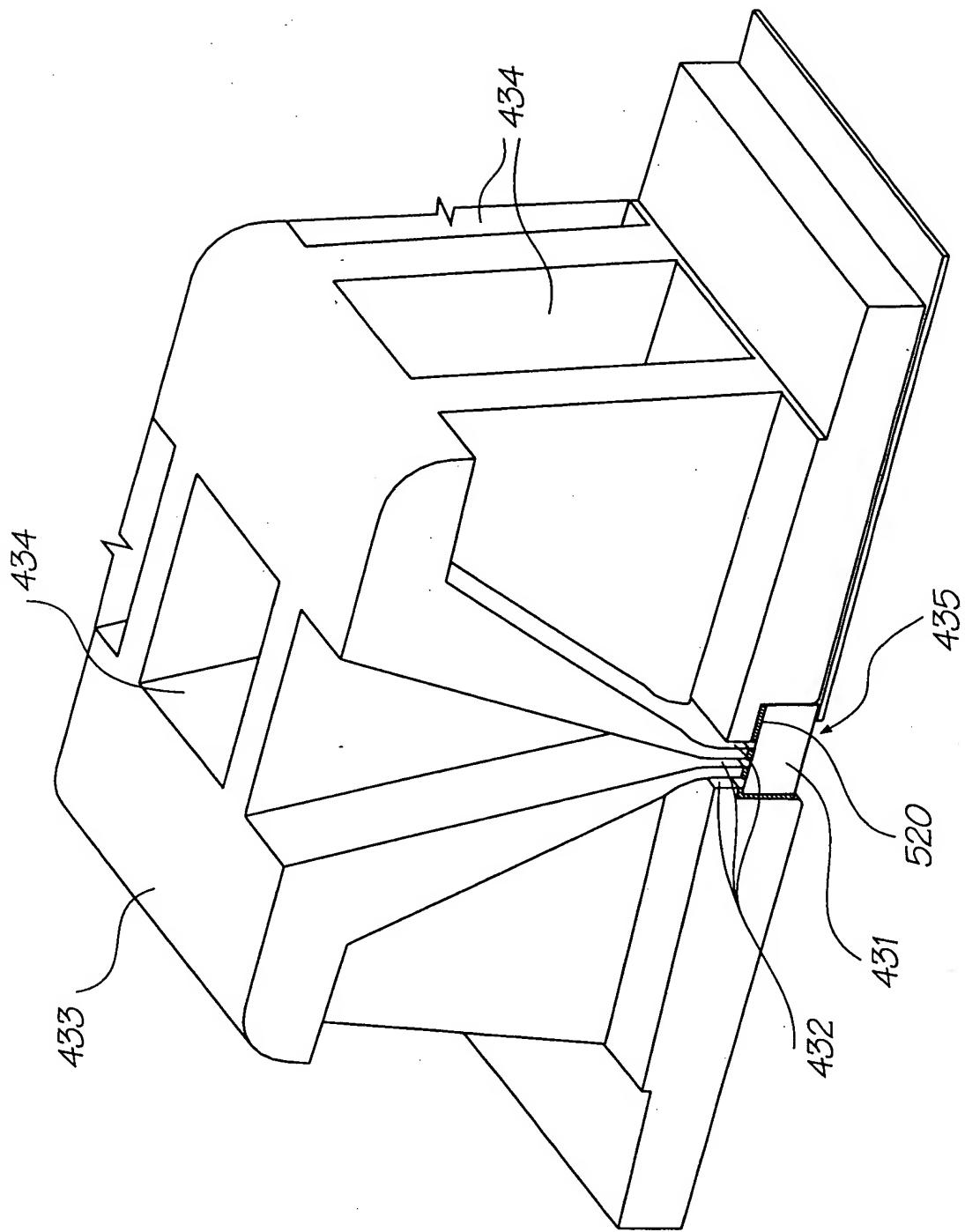


FIG. 101

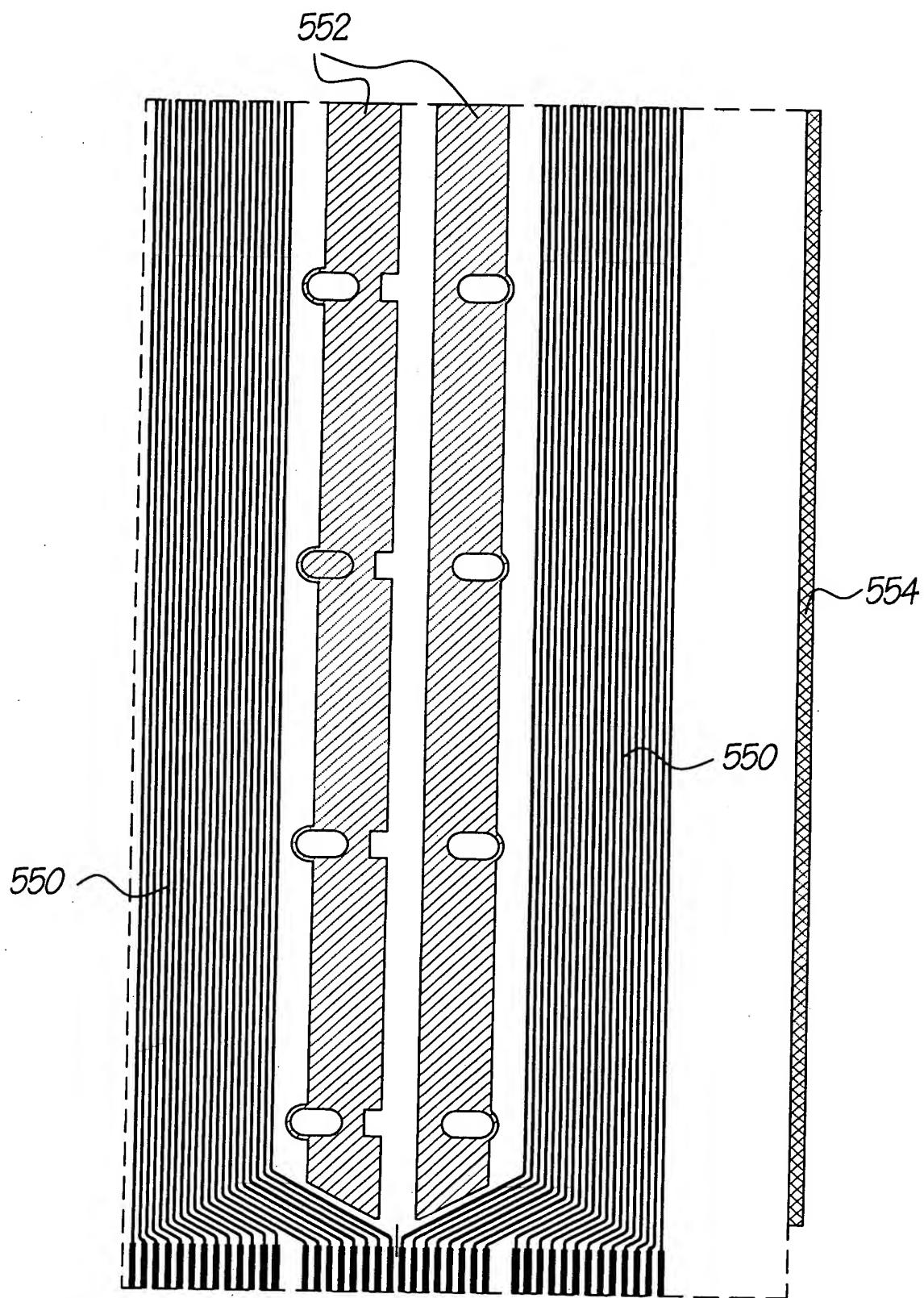


FIG. 102

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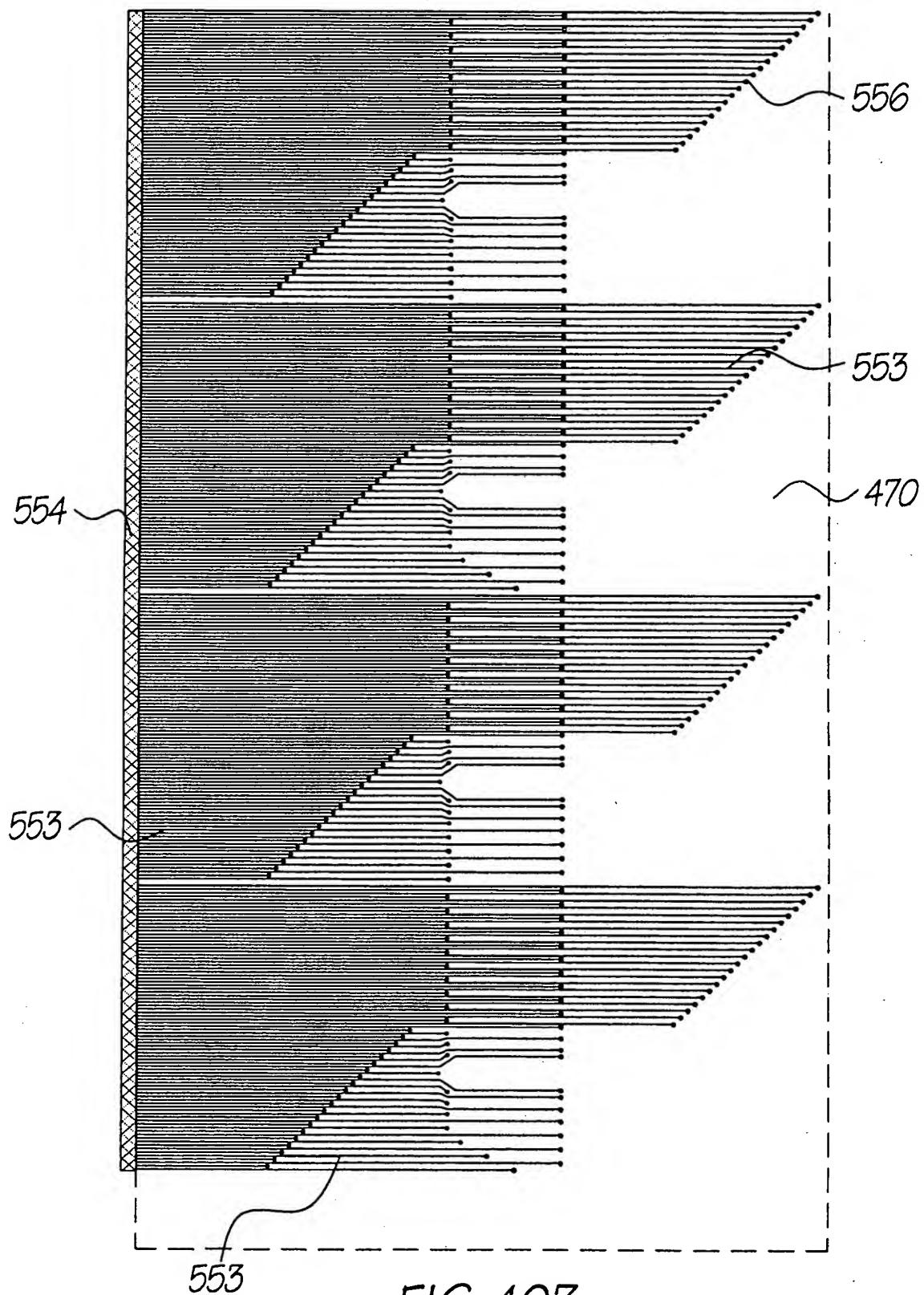


FIG. 103